```
=> FILE REG
FILE 'REGISTRY' ENTERED AT 12:12:44 ON 15 SEP 2006
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=> DISPLAY HISTORY FULL L1-

     FILE 'HCAPLUS' ENTERED AT 10:56:41 ON 15 SEP 2006
L1           422 SEA KOMIYA T?/AU
L2         51019 SEA (SOLID? OR POLYM?)(2A)ELECTROLY?
L3             3 SEA L1 AND L2
                 SEL L3 3 RN

     FILE 'REGISTRY' ENTERED AT 11:00:11 ON 15 SEP 2006
L4            20 SEA (110-86-1/BI OR 119-65-3/BI OR 120-72-9/BI OR
L5            15 SEA L4 AND N/ELS
                 E PHOSPHORIC ACID/CN
L6             1 SEA "PHOSPHORIC ACID"/CN
                 E SULFURIC ACID/CN
L7             1 SEA "SULFURIC ACID"/CN

     FILE 'HCA' ENTERED AT 11:04:47 ON 15 SEP 2006
L8         50519 SEA (SOLID? OR POLYM?)(2A)ELECTROLY? OR (PROTON? OR H OR
                 H2 OR HYDROGEN#)(3A)(COND# OR CONDUCT?)(3A)(SOLID? OR
                 POLYM?)
L9        145899 SEA L6 OR (PHOSPHORIC# OR ORTHOPHOSPHORIC#)(2A)ACID# OR
                 H3PO4
L10       426147 SEA L7 OR (SULFURIC# OR SULPHURIC# OR SULFERIC# OR
                 SULPHERIC#)(2A)ACID# OR H2SO4

     FILE 'REGISTRY' ENTERED AT 11:09:19 ON 15 SEP 2006
                 E DIAZINE/CN

     FILE 'HCA' ENTERED AT 11:11:39 ON 15 SEP 2006
L11       115909 SEA L5
L12         1129 SEA L11 AND L8
L13           92 SEA L12 AND L9
L14          125 SEA L12 AND L10

     FILE 'REGISTRY' ENTERED AT 11:12:25 ON 15 SEP 2006
                 E HYDROGEN/CN
L15            1 SEA HYDROGEN/CN
                 E OXYGEN/CN
L16            1 SEA OXYGEN/CN

     FILE 'LCA' ENTERED AT 11:13:47 ON 15 SEP 2006
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L17       32138 SEA (PRODUC? OR PROD# OR GENERAT? OR MANUF? OR MFR# OR
                CREAT? OR FORM## OR FORMING# OR FORMAT? OR MAKE# OR
                MADE# OR MAKING# OR FABRICAT? OR SYNTHESI? OR PREPAR? OR
                PREP#)/BI,AB

      FILE 'HCA' ENTERED AT 11:22:25 ON 15 SEP 2006
L18      272080 SEA L15/P OR (PRODUC? OR PROD# OR GENERAT? OR MANUF? OR
                MFR# OR CREAT? OR FORM## OR FORMING# OR FORMAT? OR MAKE#
                OR MADE# OR MAKING# OR FABRICAT? OR SYNTHESI? OR PREPAR?
                OR PREP#)(2A)(L15 OR H OR H2 OR HYDROGEN#)
L19      226241 SEA L16/P OR (PRODUC? OR PROD# OR GENERAT? OR MANUF? OR
                MFR# OR CREAT? OR FORM## OR FORMING# OR FORMAT? OR MAKE#
                OR MADE# OR MAKING# OR FABRICAT? OR SYNTHESI? OR PREPAR?
                OR PREP#)(2A)(L16 OR O OR O2 OR OXYGEN#)
L20           11 SEA (L13 OR L14) AND L18
L21            4 SEA (L13 OR L14) AND L19

      FILE 'REGISTRY' ENTERED AT 11:25:00 ON 15 SEP 2006
                E POLYETHYLENEIMINE/CN
                E POLYETHYLENE IMINE/CN

      FILE 'HCA' ENTERED AT 11:27:06 ON 15 SEP 2006
L23         1387 SEA POLYETHYLENEIMINE#/IT
                D L23 1000-1005 KWIC

      FILE 'REGISTRY' ENTERED AT 11:29:12 ON 15 SEP 2006
L24            1 SEA 9002-98-6

      FILE 'HCA' ENTERED AT 11:31:38 ON 15 SEP 2006
L25        12118 SEA L24 OR POLYETHYLENEIMINE# OR POLYETHYLENE#(A)IMINE#
L26           37 SEA L25 AND (L9 OR L10) AND L8
L27            6 SEA L26 AND (L18 OR L19)

      FILE 'REGISTRY' ENTERED AT 11:34:00 ON 15 SEP 2006
                E POLYVINYIMIDAZOLE/CN
                E POLYVINY IMIDAZOLE/CN
                E VINYL IMIDAZOLE POLYMER/CN
                E VINYL IMIDAZOLE HOMOPOLYMER/CN
                E VINYL IMIDAZOLE/CN
                E VINYLIMIDAZOLE/CN
                E VINYLIMIDAZOLE HOMOPOLYMER/CN
L28            1 SEA "VINYLIMIDAZOLE HOMOPOLYMER"/CN
                E VINYLPYRAZOLE HOMOPOLYMER/CN
                E VINYLPYRAZOLE POLYMER/CN
                E VINYLPYRAZOLE/CN
                E VINYL PYRAZOLE/CN

      FILE 'HCA' ENTERED AT 11:36:40 ON 15 SEP 2006
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L29             4 SEA POLYVINYLPYRAZOLE#
                  D L29 1-4 KWIC

     FILE 'REGISTRY' ENTERED AT 11:37:54 ON 15 SEP 2006
L30             1 SEA 25823-41-0
                  E POLYVINYLPYRIDINE/CN
                  E VINYLPYRIDINE POLYMER/CN
L31             1 SEA "VINYLPYRIDINE POLYMER"/CN

     FILE 'HCA' ENTERED AT 11:39:01 ON 15 SEP 2006
L32            31 SEA L28
L33            10 SEA L30
L34          1071 SEA L31
L35             1 SEA (L32 OR L33) AND L8
L36            48 SEA L34 AND L8
L37            12 SEA L36 AND (L9 OR L10)
L38             3 SEA L37 AND (L18 OR L19)

     FILE 'REGISTRY' ENTERED AT 11:41:32 ON 15 SEP 2006
L39             1 SEA 25233-30-1
L40             1 SEA 32109-42-5
L41             4 POLYLINK L40

     FILE 'HCA' ENTERED AT 11:51:45 ON 15 SEP 2006
L42            78 SEA L40 OR L41
L43            34 SEA L42 AND L8
L44            17 SEA L43 AND (L9 OR L10)

     FILE 'REGISTRY' ENTERED AT 11:56:02 ON 15 SEP 2006
L45             8 SEA L5 AND PMS/CI
                  D L45 1-8 IDE
                  SEL L45 1,2 RN
L46             2 SEA (131714-35-7/BI OR 50641-39-9/BI)

     FILE 'HCA' ENTERED AT 11:59:08 ON 15 SEP 2006
L47            15 SEA L46
L48         10937 SEA L39
L49             1 SEA L47 AND L8
L50           110 SEA L48 AND L8 AND (L9 OR L10)
L51             7 SEA L50 AND L18
L52             3 SEA L50 AND L19

     FILE 'REGISTRY' ENTERED AT 12:04:01 ON 15 SEP 2006
L53         10881 SEA (C(L)H(L)N)/ELS (L) 3/ELC.SUB AND PMS/CI

     FILE 'HCA' ENTERED AT 12:04:55 ON 15 SEP 2006
L54        134166 SEA L53
L55           321 SEA L54 AND L8 AND (L9 OR L10)
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L56          15 SEA L55 AND L18
L57           9 SEA L55 AND L19
L58          14 SEA L20 OR L21
L59          11 SEA L58 AND 1840-2002/PY,PRY
L60           6 SEA L27 AND 1840-2002/PY,PRY
L61          12 SEA L35 OR L38 OR L37
L62           8 SEA L61 AND 1840-2002/PY,PRY
L63           5 SEA L44 AND 1840-2002/PY,PRY
L64           9 SEA L49 OR L51 OR L52
L65           6 SEA L64 AND 1840-2002/PY,PRY
L66          23 SEA L56 OR L57
L67          12 SEA L66 NOT (L59 OR L60 OR L62 OR L63 OR L65)
L68           5 SEA L67 AND 1840-2002/PY,PRY


=> FILE HCA
FILE 'HCA' ENTERED AT 12:12:59 ON 15 SEP 2006
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=> D L59 1-11 CBIB ABS HITSTR HITIND

L59  ANSWER 1 OF 11  HCA  COPYRIGHT 2006 ACS on STN
140:96885  Proton conductive solid
     polymer electrolyte for electrochemical cell.
     Komiya, Teruaki (Honda Giken Kabushiki Kaisha, Japan). Eur. Pat.
     Appl. EP 1381107 A2 20040114, 14 pp. DESIGNATED STATES: R: AT, BE,
     CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT,
     LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK. (English). CODEN:
     EPXXDW. APPLICATION: EP 2003-254383 20030710. PRIORITY: JP
     2002-201718 20020710.
AB   A material such as imidazole (nitrogen-contg. heterocyclic compd.),
     which has at least one lone pair, is dispersed in a basic solid
     polymer such as polybenzimidazole. The mole no. of imidazole per g
     of polybenzimidazole is less than 0.0014 mol, preferably less than
     0.0006 mol. The basic solid polymer is impregnated with an acidic
     inorg. liq. such as phosphoric acid and
     sulfuric acid to prep. a proton
     conductive solid polymer
     electrolyte.
IT   91-22-5, Quinoline, uses 110-86-1, Pyridine, uses
     119-65-3, IsoQuinoline 120-72-9, Indole, uses
     120-73-0, Purine 288-13-1, Pyrazole
     288-32-4, Imidazole, uses 9002-98-6
```
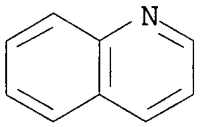
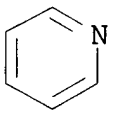

9003-47-8, Polyvinylpyridine **25232-42-2**, Polyvinylimidazole **25233-30-1 25823-41-0**, Poly(1-vinylpyrazole) **32109-42-5**, Poly(1H-benzimidazole-2,5-diyl) **50641-39-9 131714-35-7**
(**proton conductive solid polymer electrolyte** for electrochem. cell)

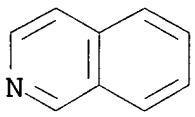
RN 91-22-5 HCA
CN Quinoline (8CI, 9CI) (CA INDEX NAME)



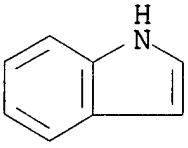
RN 110-86-1 HCA
CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



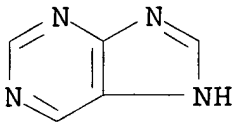
RN 119-65-3 HCA
CN Isoquinoline (6CI, 8CI, 9CI) (CA INDEX NAME)



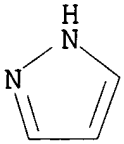
RN 120-72-9 HCA
CN 1H-Indole (9CI) (CA INDEX NAME)



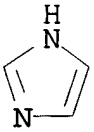
RN 120-73-0 HCA
CN 1H-Purine (9CI) (CA INDEX NAME)



RN 288-13-1 HCA
CN 1H-Pyrazole (9CI) (CA INDEX NAME)



RN 288-32-4 HCA
CN 1H-Imidazole (9CI) (CA INDEX NAME)



RN 9002-98-6 HCA
CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

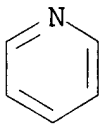
CM 1

CRN 151-56-4
CMF C2 H5 N

RN 9003-47-8 HCA
CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1337-81-1
CMF C7 H7 N
CCI IDS

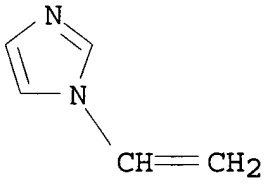


D1— CH═ CH_2

RN 25232-42-2 HCA
CN 1H-Imidazole, 1-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

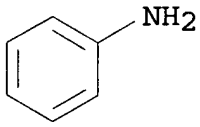
CRN 1072-63-5
CMF C5 H6 N2



RN 25233-30-1 HCA
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

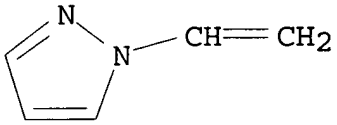
CRN 62-53-3
CMF C6 H7 N



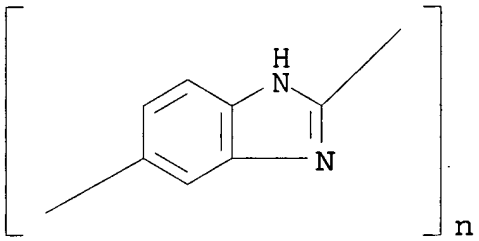
RN 25823-41-0 HCA
CN 1H-Pyrazole, 1-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

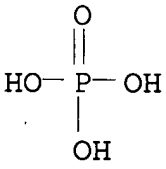
CRN 20173-98-2
CMF C5 H6 N2



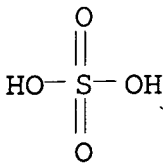
RN 32109-42-5 HCA
CN Poly(1H-benzimidazole-2,5-diyl) (9CI) (CA INDEX NAME)



RN 50641-39-9 HCA
CN Poly([5,5'-bi-1H-benzimidazole]-2,2'-diylphenylene) (9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 131714-35-7 HCA
CN Poly[(1,5-dihydrobenzo[1,2-d:4,5-d']diimidazole-2,6-diyl)phenylene] (9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **7664-38-2, Phosphoric acid**, uses
7664-93-9, Sulfuric acid, uses
(proton conductive solid polymer electrolyte for electrochem. cell)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P, Hydrogen, preparation**
7782-44-7P, Oxygen, preparation
(proton conductive solid
polymer electrolyte for electrochem. cell)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

IC ICM H01M010-40
ICS H01M006-18; C08G073-18
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72
ST electrochem cell **proton conductive solid**
polymer electrolyte; fuel cell **proton**
conductive solid polymer
electrolyte; **electrolyzer proton**
conductive solid polymer
electrolyte
IT Azines
(diazine; **proton conductive solid**
polymer electrolyte for electrochem. cell)
IT Heterocyclic compounds
(nitrogen; **proton conductive solid**
polymer electrolyte for electrochem. cell)
IT Electrochemical cells
Electrolytic cells
Fuel cell **electrolytes**
Solid electrolytes
(**proton conductive solid**
polymer electrolyte for electrochem. cell)
IT Polybenzimidazoles
(**proton conductive solid**

polymer electrolyte for electrochem. cell)
IT Ionic **conductivity**
(**proton; proton conductive solid polymer electrolyte** for electrochem. cell)
IT Fuel cells
(**solid electrolyte; proton conductive solid polymer electrolyte** for electrochem. cell)
IT 7732-18-5, Water, processes
(**electrolysis; proton conductive solid polymer electrolyte** for electrochem. cell)
IT **91-22-5**, Quinoline, uses **110-86-1**, Pyridine, uses **119-65-3**, IsoQuinoline **120-72-9**, Indole, uses **120-73-0**, Purine **288-13-1**, Pyrazole **288-32-4**, Imidazole, uses **9002-98-6 9003-47-8**, Polyvinylpyridine **25232-42-2**, Polyvinylimidazole **25233-30-1 25823-41-0**, Poly(1-vinylpyrazole) **32109-42-5**, Poly(1H-benzimidazole-2,5-diyl) **50641-39-9 131714-35-7**
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT **7664-38-2**, **Phosphoric acid**, uses **7664-93-9**, **Sulfuric acid**, uses
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT **1333-74-0P**, **Hydrogen**, **preparation** **7782-44-7P**, **Oxygen**, **preparation**
(**proton conductive solid polymer electrolyte** for electrochem. cell)

L59 ANSWER 2 OF 11 HCA COPYRIGHT 2006 ACS on STN
133:137861 **Proton conducting** membrane using a **solid** acid for fuel cells. Haile, Sossina M.; Boysen, Dane; Narayanan, Sekharipuram R.; Chisholm, Calum (California Institute of Technology, USA). PCT Int. Appl. WO 2000045447 A2 **20000803**, 61 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US1783 20000121. PRIORITY: US 1999-PV116741 19990122; US 1999-PV146946 19990802; US 1999-PV146943 19990802; US 1999-PV151811 19990830; US 1999-439377 19991115.

AB A solid acid material is used as a proton conducting membrane in an electrochem. device. The solid acid material can be one of a plurality of different kinds of materials. A binder can be added, and that binder can be either a nonconducting or a conducting binder. Nonconducting binders can be, for example, a polymer or a glass. A conducting binder enables the device to be both proton conducting and electron conducting.

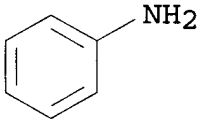
IT **25233-30-1**, Polyaniline
(**proton conducting** membrane using **solid** acid for fuel cells)

RN 25233-30-1 HCA

CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



IT **1333-74-0P**, **Hydrogen**, **preparation**
(separator; **proton conducting** membrane using **solid** acid for fuel cells)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

ICI H01

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72, 76

ST fuel cell **proton conducting** membrane **solid** acid

IT **Conducting polymers**
Electric **conductors**
Electric insulators
Semiconductor materials
(binder; **proton conducting** membrane using **solid** acid for fuel cells)

IT Fluoropolymers, uses
Glass, uses
Metals, uses
Polyesters, uses

Polymers, uses
(binder; **proton conducting** membrane using **solid** acid for fuel cells)

IT Sintering
(hot pressing; **proton conducting** membrane using **solid** acid for fuel cells)

IT Polyketones
Polyketones
(polyether-; **proton conducting** membrane using **solid** acid for fuel cells)

IT Polyethers, uses
Polyethers, uses
(polyketone-; **proton conducting** membrane using **solid** acid for fuel cells)

IT Battery electrolytes
Ceramics
Electrolytic cells
Fuel cell electrolytes
Fuel cells
(**proton conducting** membrane using **solid** acid for fuel cells)

IT Fluoropolymers, uses
Phosphates, uses
Polyanilines
Polysiloxanes, uses
Selenates
Silicates, uses
Sulfates, uses
(**proton conducting** membrane using **solid** acid for fuel cells)

IT Capacitors
(supercapacitor; **proton conducting** membrane using **solid** acid for fuel cells)

IT 7440-21-3, Silicon, uses 24937-79-9, Pvdf
(binder; **proton conducting** membrane using **solid** acid for fuel cells)

IT 7782-42-5, Graphite, uses
(paper; **proton conducting** membrane using **solid** acid for fuel cells)

IT 7722-76-1, Ammonium dihydrogen phosphate 7789-16-4, Cesium **hydrogen** sulfate cshso4 7803-63-6, Ammonium **hydrogen** sulfate 10294-60-7, Ammonium **hydrogen** selenate 12593-60-1, Ammonium phosphate sulfate ((NH4)2(H2PO4)(HSO4)) 13453-45-7, Thallium **hydrogen** sulfate tlhso4 13774-16-8, Rubidium dihydrogen phosphate 13775-30-9 13778-50-2, Sodium silicate Na3HSiO4 13780-02-4 15457-97-3, Sodium silicate (Na2H2SiO4) 15587-72-1, Rubidium **hydrogen** sulfate 16331-85-4 18649-05-3, Cesium

dihydrogen phosphate 20583-58-8, **Sulfuric acid**
, rubidium salt (2:3) 22112-04-5 39473-99-9, Rubidium phosphate selenate (Rb2(H2PO4)(HSeO4)) 41469-37-8, Sodium silicate NaH3SiO4 63317-98-6 63737-07-5, Cesium **hydrogen** selenate cshseo4 68875-27-4, Rubidium **hydrogen** selenate 71555-62-9 88937-51-3 89190-25-0 99489-71-1, Ammonium arsenate sulfate ((NH4)2(H2AsO4)(HSO4)) 99543-07-4, Selenic acid, cesium salt (2:3) 101811-97-6, Potassium silicate KH3SiO4 135498-03-2 135710-63-3 157612-88-9 161430-99-5, Tellurium oxide teo4 161882-09-3 165901-90-6, Cesium phosphate sulfate (Cs3(H2PO4)(HSO4)2) 183953-14-2, Silicic acid (H4SiO4), tripotassium salt 183953-17-5, Silicic acid (H4SiO4), dipotassium salt 213411-40-6, Cesium phosphate sulfate (Cs3(H2PO4)0.5(HSO4)2.5) 218931-29-4, Cesium phosphate sulfate (Cs5(H2PO4)2(HSO4)3) 220078-67-1, Cesium phosphate selenate (Cs3(H2PO4)(HSeO4)2) 220078-71-7, Cesium phosphate selenate (Cs5(H2PO4)2(HSeO4)3) 231277-45-5, Cesium phosphate sulfate (Cs2(H2PO4)(HSO4)) 233277-01-5, Ammonium phosphate selenate ((NH4)2(H2PO4)(HSeO4)) 260429-55-8, Rubidium phosphate sulfate (Rb2(H2PO4)(HSO4)) 286382-74-9, Cesium phosphate selenate (Cs2(H2PO4)(HSeO4)) 286382-75-0 286382-77-2 286382-78-3 286382-79-4, Cesium phosphate selenate (Cs3(H2PO4)0.5(HSeO4)2.5) 286382-81-8 286382-82-9 286382-83-0 286382-84-1 286382-85-2 286382-86-3 286382-87-4 286382-88-5 286382-89-6 286382-90-9
(**proton conducting** membrane using **solid** acid for fuel cells)

IT 1302-88-1, Cordierite 1309-48-4, Magnesia, uses 1344-28-1, Alumina, uses 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-22-4, Silver, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-66-6, Zinc, uses 7631-86-9, Silica, uses 9002-84-0, Ptfe 25038-78-2, Poly(dicyclopentadiene) **25233-30-1**, Polyaniline 25667-42-9 30604-81-0, Polypyrrole 31900-57-9, Polydimethyl siloxane
(**proton conducting** membrane using **solid** acid for fuel cells)

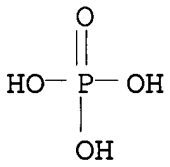
IT **1333-74-0P**, **Hydrogen**, **preparation**
(separator; **proton conducting** membrane using **solid** acid for fuel cells)

L59 ANSWER 3 OF 11 HCA COPYRIGHT 2006 ACS on STN
131:164272 Electrolytic capacitor and its manufacture. Saito, Kazuyo; Nitta, Yukihiro; Tada, Hiroshi; Iwamoto, Shigeyoshi (Matsushita Electric Industrial Co., Ltd., Japan). Eur. Pat. Appl. EP 938108 A2 **19990825**, 17 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1999-100927 19990120. PRIORITY: JP 1998-15269 19980128; JP 1998-350072 19981209.

AB An electrolytic capacitor includes (a) a capacitor element having a pos. electrode, a neg. electrode, and a solid org. conductive material disposed between the pos. electrode and the neg. electrode; (b) an electrolyte; (c) a case for accommodating the capacitor element and the electrolyte; and (d) a sealing member disposed to cover the opening of the case. The solid org. conductive material contains an org. semiconductor and/or a conductive polymer. An electrolytic capacitor having excellent impedance characteristic, small leakage current, excellent reliability, and high dielec. strength is obtained.

IT **7664-38-2**, **Phosphoric acid**, processes
25233-30-1, Polyaniline **25233-30-1D**, Polyaniline, sulfonated
(**manuf.** of electrolytic capacitors contg.)

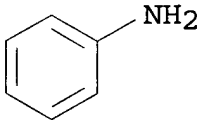
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 25233-30-1 HCA
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

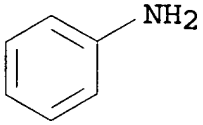
CRN 62-53-3
CMF C6 H7 N



RN 25233-30-1 HCA
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



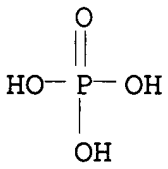
IC ICM H01G009-02
CC 76-10 (Electric Phenomena)
Section cross-reference(s): 38
IT Conducting **polymers**
Manila hemp (Musa textilis)
Paper
Seals (parts)
(manuf. of **electrolytic** capacitors contg.)
IT 56-81-5, 1,2,3-Propanetriol, processes 62-23-7, p-Nitrobenzoic acid 69-65-8, Mannite 88-75-5 96-48-0 107-21-1, 1,2-Ethanediol, processes 552-16-9, **o**-Nitrobenzoic acid 1518-16-7D, TCNQ, complexes 1623-15-0, Monobutyl phosphate 3385-41-9, Diammonium adipate 7429-90-5, Aluminum, processes 7440-44-0, Carbon, processes **7664-38-2**, **Phosphoric acid**, processes 7727-54-0, Ammonium persulfate 7803-65-8 10028-22-5, Ferric sulfate 10043-35-3, Boric acid, processes 13445-49-3, Peroxydisulfuric acid ([(HO)S(O)2]2O2) **25233-30-1**, Polyaniline **25233-30-1D**, Polyaniline, sulfonated 25233-34-5, Polythiophene 25233-34-5D, Polythiophene, sulfonated 30604-81-0, Polypyrrole 30604-81-0D, Polypyrrole, sulfonated 50905-10-7, 1,6-Decanedicarboxylic acid 77214-82-5 88107-08-8 92538-40-4 117920-72-6 126213-51-2 127171-87-3, Tetramethyl ammonium phthalate, processes 167552-54-7, processes
(**manuf.** of electrolytic capacitors contg.)

L59 ANSWER 4 OF 11 HCA COPYRIGHT 2006 ACS on STN
129:61705 Bipolar electrochemical charge storage devices and their fabrication. Li, Changming; Jung, Richard H.; Nerz, John (Motorola, Inc., USA). U.S. US 5768090 A **19980616**, 9 pp. (English). CODEN: USXXAM. APPLICATION: US 1996-755876 19961202.
AB An electrochem. capacitor cell is provided with 1st and 2nd electrodes, and a **solid polymer electrolyte** is disposed between them. The electrodes may be either the same or different materials and may be fabricated from Ru, Ir, Co, W, V, Fe, Mo, Hf, Ni, Ag, Zn, and combinations thereof. The **solid polymer electrolyte** is in intimate contact with both electrodes, and is made from a polymeric support structure having an electrolyte active species dispersed in it. Also a method of fabricating a bipolar electrochem. charge storage device by assembling at least the 1st and 2nd bipolar subassemblies together with the 2nd layer of electrode active

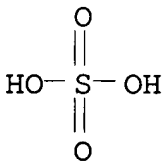
material for the 1st bipolar subassembly in direct contact with the 1st layer of electrode active material for the 2nd bipolar subassembly without a current collector disposed between them is described.

IT **7664-38-2, Phosphoric acid**, processes
7664-93-9, Sulfuric acid, processes
9002-98-6 9003-47-8, Poly(vinyl pyridine)
(fabrication of bipolar electrochem. charge storage devices contg.)

RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



RN 9002-98-6 HCA
CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

CM 1

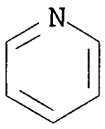
CRN 151-56-4
CMF C2 H5 N

RN 9003-47-8 HCA
CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1337-81-1

CMF C7 H7 N
CCI IDS



D1— CH═ CH_2

IC ICM H01G009-00
INCL 361523000
CC 76-10 (Electric Phenomena)
Section cross-reference(s): 38, 52, 72
ST bipolar electrochem charge storage device manuf; **polymer electrolyte** electrochem capacitor manuf
IT Electrolytes
(fabrication of bipolar electrochem. charge storage devices having **polymer electrolytes**)
IT Polymers, processes
(fabrication of bipolar electrochem. charge storage devices having **polymer electrolytes**)
IT 1310-58-3, Potassium hydroxide, processes 1310-65-2, Lithium hydroxide (LiOH) 1310-73-2, Sodium hydroxide (NaOH), processes 7439-88-5, Iridium, processes 7439-89-6, Iron, processes 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes 7440-18-8, Ruthenium, processes 7440-22-4, Silver, processes 7440-33-7, Tungsten, processes 7440-48-4, Cobalt, processes 7440-58-6, Hafnium, processes 7440-62-2, Vanadium, processes 7440-66-6, Zinc, processes 7647-01-0, **Hydrogen** chloride, processes **7664-38-2**, **Phosphoric acid**, processes **7664-93-9**, **Sulfuric acid**, processes 7697-37-2, Nitric acid, processes 9002-89-5, Polyvinyl alcohol **9002-98-6** 9003-01-4, Polyacrylic acid 9003-05-8, Polyacrylamide 9003-06-9, Acrylamide-acrylic acid copolymer 9003-35-4, Phenol-formaldehyde copolymer 9003-39-8, Poly(vinyl pyrrolidone) **9003-47-8**, Poly(vinyl pyridine) 12036-10-1, Ruthenium oxide (RuO2) 24981-14-4, Poly(vinyl fluoride) 25249-16-5, Poly(2-hydroxyethyl methacrylate) 25322-68-3, Polyethylene glycol 28390-30-9 29011-20-9 85885-77-4, Cerium hydroxide (CeOH)
(**fabrication** of bipolar electrochem. charge storage devices contg.)

L59 ANSWER 5 OF 11 HCA COPYRIGHT 2006 ACS on STN

127:18475 **Proton-conductive polymer solid electrolytes.** Bessho, Keiichi; Teramoto, Toshio; Ishikawa, Katsuhiro (Japan Synthetic Rubber Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 09087510 A2 **19970331** Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-268064 19950922.

AB The title electrolytes, useful for primary, secondary, and fuel batteries, display devices, sensors, capacitors, ion-exchange membranes, etc. (no data), are prepd. from (a) introducing sulfone or phosphoric group to arom. or N-contg. ring polymers with heat resistance >250° [e.g., reaction **product** of (**O**-p-C6H4-p-C6H4-CO2-p-C6H4)n and **H2SO4**] and (b) **polymer** with **proton cond.** at relative humidity 50% 10-5 s/cm, polymer with water absorptivity >1%, and/or polymer with glass transition temp. <0° [e.g., polyoxyethylene, polyethyleneimine, poly(vinyl alc.)].

IT **9002-98-6**
(**proton-conductive polymer solid electrolytes**)

RN 9002-98-6 HCA

CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

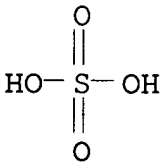
CM 1

CRN 151-56-4
CMF C2 H5 N

IT **7664-93-9, Sulfuric acid**, reactions
(**proton-conductive polymer solid electrolytes**)

RN 7664-93-9 HCA

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IC ICM C08L071-00
ICS C08L065-00; G01N027-406; H01G009-028; H01M006-18; H01M008-02; H01M010-40

CC 37-6 (Plastics Manufacture and Processing)
ST **proton conductive polymer solid electrolyte**; sulfonated polyoxyphenylene polycarbonate proton conductor; polyoxyethylene **proton conductive solid electrolyte**; polyethyleneimine **proton conductive solid electrolyte**; polyvinyl alc **proton conductive solid electrolyte**
IT **Conducting polymers**
(ionic; **proton-conductive polymer solid electrolytes**)
IT Polyoxyphenylenes
Polyoxyphenylenes
(polyester-; **proton-conductive polymer solid electrolytes**)
IT Polyesters, reactions
Polyesters, reactions
(polyoxyphenylene-; **proton-conductive polymer solid electrolytes**)
IT Sulfonation
(**proton-conductive polymer solid electrolytes**)
IT Polyamines
Polyoxyalkylenes, uses
(**proton-conductive polymer solid electrolytes**)
IT Polybenzimidazoles
(**proton-conductive polymer solid electrolytes**)
IT 25734-65-0DP, reaction product with 1,3-propanesultone
189640-60-6DP, reaction product with 1,3-propanesultone
189768-11-4DP, reaction product with **sulfuric acid**
189768-12-5DP, reaction product with **sulfuric acid**
(**proton-conductive polymer solid electrolytes**)
IT 9002-89-5, Poly(vinyl alcohol) **9002-98-6** 25322-68-3
26913-06-4, Poly[imino(1,2-ethanediyl)]
(**proton-conductive polymer solid electrolytes**)
IT 1120-71-4D, 1,3-Propanesultone, reaction products with polybenzimidazoles **7664-93-9**, **Sulfuric acid**, reactions 16672-87-0 25734-65-0 91442-06-7 189768-12-5
(**proton-conductive polymer solid electrolytes**)

L59 ANSWER 6 OF 11 HCA COPYRIGHT 2006 ACS on STN
122:276448 Transport of protons and water through polyaniline membranes

studied with online mass spectrometry. Schmidt, V. M.; Tegtmeyer, D.; Heitbaum, J. (Institut fuer Physikalische Chemie, Universitaet Witten/Herdecke, Stockumer Strasse 10, Witten-Annen, 58453, Germany). Journal of Electroanalytical Chemistry, 385(2), 149-55 (English) **1995.** CODEN: JECHES. ISSN: 0368-1874. Publisher: Elsevier.

AB The hydrogen evolution reaction (HER) was followed during the polymn. of aniline on porous platinum electrodes by cyclic voltammetry combined with online mass spectrometry. The reaction takes place at the electrode|polymer interface by considering the collection efficiency of the membrane inlet system. Homogeneous films of polyaniline (PANI) can be deposited onto porous electrode substrates. In this way, a pervaporation membrane is formed with the conducting polymer as the active layer. The permeation of water through a PANI membrane is dependent on the oxidn. state of PANI. The higher permeability in the oxidized state is explained in terms of structural alterations during the redox process.

IT **1333-74-0P**, Hydrogen, properties
(electrochem. evolution during aniline polymn. on porous platinum studied by cyclic voltammetry and mass spectrometry)

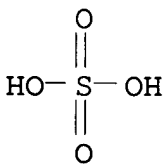
RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

IT **7664-93-9**, **Sulfuric acid**, uses
(redox of polyaniline in **sulfuric acid** accompanied by potential-dependent permeation of water)

RN 7664-93-9 HCA

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **25233-30-1P**, Polyaniline
(transport of protons and water through polyaniline membranes studied with online mass spectrometry)

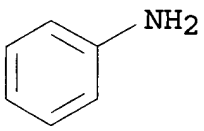
RN 25233-30-1 HCA

CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3

CMF C6 H7 N



CC 72-2 (Electrochemistry)
Section cross-reference(s): 35, 36, 66

IT Permeability and Permeation
(redox of polyaniline in **sulfuric acid** accompanied by potential-dependent permeation of water)

IT Electric **conductors, polymeric**
(transport of **protons** and water through polyaniline)

IT Redox reaction
(electrochem., of polyaniline in **sulfuric acid** accompanied by potential-dependent permeation of water)

IT **1333-74-0P**, Hydrogen, properties
(electrochem. evolution during aniline polymn. on porous platinum studied by cyclic voltammetry and mass spectrometry)

IT **7664-93-9, Sulfuric acid**, uses
(redox of polyaniline in **sulfuric acid** accompanied by potential-dependent permeation of water)

IT **25233-30-1P**, Polyaniline
(transport of protons and water through polyaniline membranes studied with online mass spectrometry)

L59 ANSWER 7 OF 11 HCA COPYRIGHT 2006 ACS on STN

111:42849 Hydrogen separation and electricity generation using novel electrolyte membranes. Polak, Anthony J.; Petty-Weeks, Sandra (Allied-Signal, Inc., USA). U.S. US 4797185 A **19890110**, 12 pp. Cont. of U. S. Ser. No. 756,889, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1987-70620 19870706. PRIORITY: US 1984-687351 19841228; US 1985-756889 19850719.

AB An app. for performing an electrochem. process involving a gaseous mixt. having a component which, in the presence of a catalytic agent, is capable of dissocg. to yield H ions or of combining with H ions, comprises a thin-film macroscopically homogeneous polymer blend membrane, a membrane housing comprising a 1st and a 2nd gas chamber sepd. by the membrane, 2 sep. portions of catalytic agent effective to promote the dissocn. and combination, and means for forming an elec. connection in operative contact with the catalytic agent. The app. comprises also means to supply fuel gas to 1 and oxidant gas to the other of the 2 chambers, or to supply the gaseous mixt. to 1 and remove H from the other chamber. The membrane possessing a high protonic cond. and formed by removing the solvent from a soln. of a **phosphoric acid** and a polymer

contains .apprx.10-70% H2PO3, HPO3, **H3PO4**, H4P2O7, and polyphosphoric acid and .apprx.30-90% polymer such as poly(vinyl alc.), poly(vinyl fluoride), polyethylene glycol, etc. In 1 version, the membrane may be formed into a hollow fiber having elec. conductive particles with catalyst embedded in the fiber walls; a multiplicity of such fibers may be used to **form** a **H** sepn. device.

IT **9002-98-6**, Polyethylenimine **9003-47-8**, Poly(vinyl pyridine)
(membranes from blends contg. phosphorus acids and, for fuel cells and hydrogen sepn.)

RN 9002-98-6 HCA
CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

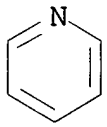
CM 1

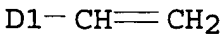
CRN 151-56-4
CMF C2 H5 N

RN 9003-47-8 HCA
CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

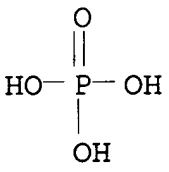
CRN 1337-81-1
CMF C7 H7 N
CCI IDS



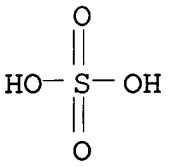


IT **7664-38-2**, **Phosphoric acid**, uses and miscellaneous **7664-93-9**, **Sulfuric acid**, uses and miscellaneous
(membranes from blends contg. polymer and, for fuel cells and hydrogen sepn.)

RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P, Hydrogen, preparation**
(sepn. of, membranes from phosphorus acid-polymer blends for)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

IC ICM C25B001-02
ICS C25B009-00
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49, 72
ST hydrogen sepn acid polymer membrane; fuel cell acid polymer membrane; **phosphoric acid** polymer membrane cond; **cond protonic** acid **polymer** membrane
IT 9002-89-5, Poly(vinyl alcohol) **9002-98-6**, Polyethylenimine 9003-01-4, Poly(acrylic acid) 9003-05-8, Poly(acrylamide) 9003-43-4, Poly(vinyl pyrrolidine) **9003-47-8**, Poly(vinyl pyridine) 9004-35-7, Cellulose acetate 24981-14-4, Poly(vinyl fluoride) 25189-55-3, Poly(N-isopropyl acrylamide) 25322-68-3, Poly(ethylene glycol) 25805-17-8, Poly(ethyloxazoline) 26101-52-0, Poly(vinyl sulfonic acid) 26793-34-0, Poly(N,N-dimethyl acrylamide) 26913-06-4, Polyethylenimine
(membranes from blends contg. phosphorus acids and, for fuel cells and hydrogen sepn.)
IT 2466-09-3, Pyrophosphoric acid **7664-38-2**, **Phosphoric acid**, uses and miscellaneous

7664-93-9, Sulfuric acid, uses and
miscellaneous 7803-60-3, Hypophosphoric acid 10343-62-1, Metaphosphoric acid
(membranes from blends contg. polymer and, for fuel cells and hydrogen sepn.)

IT **1333-74-0P, Hydrogen, preparation**
(sepn. of, membranes from phosphorus acid-polymer blends for)

L59 ANSWER 8 OF 11 HCA COPYRIGHT 2006 ACS on STN

110:138716 Hydrogen separation and electricity generation using novel three-component membrane. Young, Ping; Polak, Anthony J. (Allied-Signal, Inc., USA). U.S. US 4795536 A **19890103**, 13 pp. Cont. of U.S. Ser. No. 753,495, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1987-70622 19870706. PRIORITY: US 1985-753495 19850710.

AB An app. for performing an electrochem. process involving a gaseous mixt. having a component which in presence of a catalytic agent is capable of dissocg. to yield H+ or of combining with H+ comprises a thin-film polymer-blend membrane, a membrane housing comprising a 1st and a 2nd gas chamber sepd. by the membrane, 2 sep. portions of catalytic agent effective to promote the dissocn. and combination, and means for forming elec. connection in operative contact with the catalytic agent. The app. comprises also means to supply fuel gas to 1 and oxidant gas to the other of the 2 chambers, or to supply the gaseous mixt. to 1 and remove H from the other of the 2 chambers. The membrane possessing a high **H**+ cond. and **formed** by removing the solvent from a soln. of a blend of 3 components: H2PO3, HPO3, **H3PO4**, H4P2O7, and polyphosphoric acid .apprx.10-50; an org. polymer such as poly(vinyl alc.), poly(vinyl fluoride), etc. .apprx.40-80; and a poly(org. acid) such as poly(acrylic acid) .apprx.10-40 mol%. For increased strength, a membrane may be composited with or attached to a porous support. In 1 version, elec. conductive particles with catalyst are partly embedded in the membrane to **form** a **H** sepg. device.

IT **9002-98-6**, Polyethylenimine
(electrolyte membranes from blends contg. **phosphoric acid**-poly(org. acid)-, for fuel cells and hydrogen sepn.)

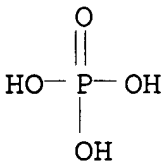
RN 9002-98-6 HCA

CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

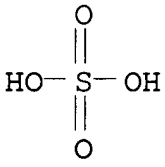
CM 1

CRN 151-56-4
CMF C2 H5 N

IT **7664-38-2, Phosphoric acid**, uses and miscellaneous **7664-93-9, Sulfuric acid**, uses and miscellaneous
(electrolyte membranes from blends contg. polymer-poly(org. acid)-, for fuel cells and hydrogen sepn.)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P, Hydrogen, preparation**
(sepn. of, electrolyte membranes from **phosphoric acid**-polymer-poly(org. acid) for)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

IC ICM C25B001-02
ICS C25B009-00
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49, 72
ST hydrogen electrolytic sepn composite electrolyte; fuel cell **solid electrolyte** composite; **phosphoric acid polymer electrolyte** composite;

polyorg acid **polymer electrolyte** composite; cond **solid electrolyte** composite

IT Fuel cells
(electrolyte membranes for, **phosphoric acid** -polymer-poly(org. acid) blend)

IT 9002-89-5, Poly(vinyl alcohol) **9002-98-6**, Polyethylenimine 9004-35-7, Cellulose acetate 24981-14-4, Poly(vinyl fluoride) 25322-68-3, Polyethylene glycol
(electrolyte membranes from blends contg. **phosphoric acid**-poly(org. acid)-, for fuel cells and hydrogen sepn.)

IT 9003-01-4, Poly(acrylic acid) 25087-26-7, Poly(methacrylic acid) 50851-57-5, Poly(styrenesulfonic acid)
(electrolyte membranes from blends contg. **phosphoric acid**-polymer-, for fuel cells and hydrogen sepn.)

IT 2466-09-3, Pyrophosphoric acid **7664-38-2**, **Phosphoric acid**, uses and miscellaneous **7664-93-9**, **Sulfuric acid**, uses and miscellaneous 7803-60-3, Hypophosphoric acid 10343-62-1, Metaphosphoric acid
(electrolyte membranes from blends contg. polymer-poly(org. acid)-, for fuel cells and hydrogen sepn.)

IT **1333-74-0P**, **Hydrogen**, **preparation**
(sepn. of, electrolyte membranes from **phosphoric acid**-polymer-poly(org. acid) for)

L59 ANSWER 9 OF 11 HCA COPYRIGHT 2006 ACS on STN

107:62049 Electrochemical method and apparatus using **proton-conducting polymers.** Zupancic, Joseph J.; Swedo, Raymond J.; Petty-Weeks, Sandra L. (UOP Inc., USA). U.S. US 4664761 A **19870512**, 10 pp. (English). CODEN: USXXAM. APPLICATION: US 1985-814339 19851227.

AB An interpenetrating polymer-network membrane for use as **solid electrolyte** in fuel cells or sepn. of H from gas mixt. or other electrochem. processes involving H+ contains a host polymer blend of **H3PO4** or **H2SO4** mixed with a polymer or copolymer of ethyleneimine, acrylic acid, ethylene oxide, 2-ethyl-2-oxazoline, acrylamide, N-substituted acrylamide, 4-vinylpyridine, methacrylic acid, N-vinylimidazole, vinylsulfonic acid, 2-vinylpyridine, poly(hydroxyethylene), or PhOH-HCHO resin and a guest polymer of acrylic acid, methacrylic acid, acrylamide, methacrylamide, 2-acrylamido-2-methylpropanesulfonic acid, N-benzylacrylamide, N-ethylmethylacrylamide, N-phenylacrylamide, or N-phenylmethacrylamide crosslinked by methylenebisacrylamide, N,N-diallylacryllamide, m-xylenebisacrylamide, or N,N'-trimethylenebisacrylamide where the repeating units of the guest polymer is different from that of the host polymer. The membrane is coated with catalysts on opposite sides and used as partitioner to sep. 2 gas chambers in an app. An aq. soln. of

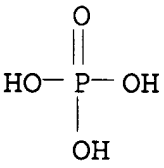
H3PO4 and poly(vinyl alc.) and an aq. soln. of methylenebisacrylamide and methacrylic acid were mixed, poured into a Petri dish, H2O was evapd., the film was irradiated by a 175-keV electron beam at 5 Mrad/pass from 1 side, cut into a 1"-diam. disk, and sputtered to form 400-Å Pt layers on both sides. This disk had a resistivity of 2 + 106 Ω-cm and a H flux of 1.8 + 10-5 ft3/ft2-h.

IT **1333-74-0P, Hydrogen, preparation**
(sepn. of, from gas mixts. by electrochem. processes, **solid polymer electrolytes** for)

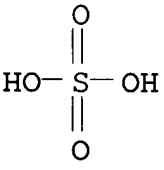
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

IT **7664-38-2, Phosphoric acid**, uses and miscellaneous **7664-93-9, Sulfuric acid**, uses and miscellaneous **9002-98-6 25232-42-2**, Poly(N-vinylimidazole)
(**solid electrolytes** contg., **proton-conductive**, for fuel cells and other electrochem. app)

RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



RN 9002-98-6 HCA
CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

CM 1

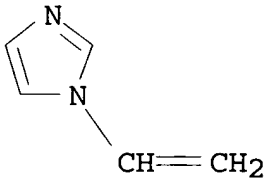
CRN 151-56-4

CMF C2 H5 N

RN 25232-42-2 HCA
CN 1H-Imidazole, 1-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1072-63-5
CMF C5 H6 N2



IC ICM C25B001-02
ICS H01M008-10
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 47, 49, 72
ST polyvinyl alc **phosphoric acid** electrolyte;
polymethacrylic acid **solid electrolyte**;
fuel cell **polymer solid electrolyte**;
hydrogen sepn **polymer solid electrolyte**
IT Fuel cells
(**electrolytes** for, **solid polymer**)
IT 30421-16-0, Methacrylic acid-methylenebisacrylamide copolymer
(crosslinked, **solid electrolytes** contg.,
proton-conductive, for fuel cells and other
electrochem. app.)
IT **1333-74-0P**, **Hydrogen**, **preparation**
(sepn. of, from gas mixts. by electrochem. processes,
solid polymer electrolytes for)
IT **7664-38-2**, **Phosphoric acid**, uses and
miscellaneous **7664-93-9**, **Sulfuric acid**
, uses and miscellaneous 9002-89-5 **9002-98-6**
9003-01-4, Poly(acrylic acid) 9003-05-8 9003-35-4, Formaldehyde
phenol copolymer 25014-15-7, Poly(2-vinylpyridine) 25087-26-7,
Poly(methacrylic acid) 25232-41-1, Poly(4-vinylpyridine)
25232-42-2, Poly(N-vinylimidazole) 25322-68-3,

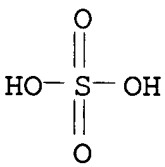
Poly(ethylene oxide) 25805-17-8, Poly(2-ethyl-2-oxazoline) 26101-52-0, Poly(vinyl sulfonic acid)
(**solid electrolytes** contg., **proton-conductive**, for fuel cells and other electrochem. app)

L59 ANSWER 10 OF 11 HCA COPYRIGHT 2006 ACS on STN
105:7055 Electrically conductive aniline polymers. Tamura, Shohei; Sasaki, Sadamitsu; Sasaki, Takeshi; Abe, Masao; Miyatake, Hiroshi (Nitto Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 61021129 A2 **19860129** Showa, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1984-142845 19840709.

AB An elec. conductive polymer with cond. ≥10°S/cm is prepd. by electrolysis of an aniline soln. contg. **H2SO4** at 1:≥5-30 aniline- **H2SO4** equiv. ratio and a voltage >1 V higher than the std. calomel electrode and 0.01 mA/cm2-1 A/cm2. Thus, the **electrolytic polymn.** was conducted in a 5% aq. aniline soln. contg. **H2SO4** in 1:8 equiv. ratio at +2V (initially) and 5 mA/cm2 for 2 **h** to **form** a **H2SO4**-doped aniline polymer on a Pt electrode maintaining cond. 2.6 S/cm after 4 mo of exposure to air.

IT **7664-93-9P**, properties
(aniline polymers doped with, elec. conductive, oxidative degrdn.-resistant, prepn. of, by **electrolytic polymn.**)

RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)

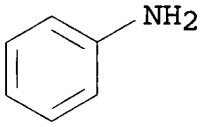


IT **25233-30-1P**
(**sulfuric acid**-doped, elec. conductive, oxidative degrdn.-resistant, prepn. of, by **electrolytic polymn.**)

RN 25233-30-1 HCA
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



IC ICM C08G073-00
CC 35-7 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 76
ST aniline polymer **sulfuric acid** doping; elec conductive aniline polymer; **electrolytic polymn** aniline
IT Electric conductors
(aniline polymers, doped with **sulfuric acid**, oxidative degrdn.-resistant, prepn. of, by **electrolytic polymn.**)
IT Polymerization
(electrochem., of aniline in presence of **sulfuric acid**, in manuf. of elec. conductive polymers with high oxidative degrdn. resistance)
IT **7664-93-9P**, properties
(aniline polymers doped with, elec. conductive, oxidative degrdn.-resistant, prepn. of, by **electrolytic polymn.**)
IT **25233-30-1P**
(**sulfuric acid**-doped, elec. conductive, oxidative degrdn.-resistant, prepn. of, by **electrolytic polymn.**)

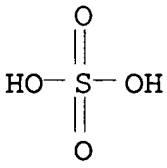
L59 ANSWER 11 OF 11 HCA COPYRIGHT 2006 ACS on STN
103:88374 Electroconductive organic polymers. Tamura, Shohei; Sasaki, Sadamitsu; Abe, Masao; Nakazawa, Hitoshi; Ichinose, Hisashi; Nakamoto, Keiji; Sasaki, Takeshi; Ezoe, Minoru; Sakagawa, Mitsuo; Miyataka, Hiroshi (Nitto Electric Industrial Co., Ltd. , Japan). Ger. Offen. DE 3441011 A1 **19850605**, 69 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1984-3441011 19841109. PRIORITY: JP 1983-212280 19831110; JP 1983-212281 19831110; JP 1984-198873 19840922.
AB Polymers contg. the repeating units -p-C6H3(R)N:C6H3(R):N-p- (R = **H**, alkyl), **prepd.** by oxidative polymn. of aniline derivs., when doped with electron acceptors have elec. cond. ≥10 μS/cm. Thus, adding a soln. of 1.84 g K2Cr2O7 and 4.61 g **H2SO4** in 28.8 g H2O over 30 min to a soln. of 5 g PhNH2 and 4 mL cond. HCl in 45 g H2O stirred in an ice bath and stirring 30 min gave a green polymer [**25233-30-1**] with inherent viscosity (**H2SO4**, 30°) 0.46 and elec. cond. 2.0 S/cm, unchanged on standing 4 mo in air or when measured

in vacuo (0.01 torr).

IT **7664-93-9**, uses and miscellaneous
(doping agent, for elec. conductive polyanilines)

RN 7664-93-9 HCA

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



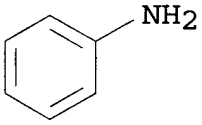
IT **25233-30-1P**
(elec. conductive, proton acid-doped, manuf. of)

RN 25233-30-1 HCA

CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



IC ICM C08G073-02
ICS H01L031-04; H01L029-28; H01B001-12

CC 35-5 (Chemistry of Synthetic High Polymers)

ST elec conductor polyaniline; aniline polymer elec conductor; doping polyaniline conductive; oxidative polymn aniline; chromic acid polymn aniline; **sulfuric acid** polymn aniline

IT Electric **conductors**
(aniline deriv. **polymers**, **proton** acid-doped, manuf. of)

IT 7601-90-3, uses and miscellaneous 7647-01-0, uses and miscellaneous **7664-93-9**, uses and miscellaneous 7697-37-2, uses and miscellaneous 10035-10-6, uses and miscellaneous 16872-11-0 16940-81-1
(doping agent, for elec. conductive polyanilines)

IT **25233-30-1P** 97917-08-3P
(elec. conductive, proton acid-doped, manuf. of)

=> D L68 1-5 CBIB ABS HITSTR HITIND

L68 ANSWER 1 OF 5 HCA COPYRIGHT 2006 ACS on STN
139:186482 Novel catalysts and processes for their preparation. Chen, Jun; Swiegers, Gerhard F.; Too, Chee O.; Wallace, Gordon G. (Commonwealth Scientific and Industrial Research Organisation, Australia; University of Wollongong). PCT Int. Appl. WO 2003068392 A1 20030821, 68 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-AU143 20030211. PRIORITY: AU 2002-445 20020211.

AB Accordingly, in an aspect of the invention, and not necessarily the broadest aspect, there is provided a hybrid homogeneous-heterogeneous catalyst contg. catalytic groups, wherein the catalytic activity of the catalyst is largely provided as a result of the interaction of catalytic groups in a suitable proximity and disposition to other catalytic groups, the proximity and disposition resulting from statistical considerations.

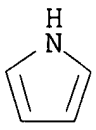
IT **1333-74-0P**, Hydrogen, processes
(novel catalysts for electrochem. generation of)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

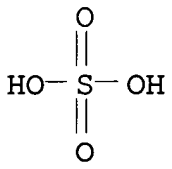
IT **30604-81-0P**, Polypyrrole
(novel catalysts for electrochem. **generation** of **hydrogen** contg. polypyrrole-ferrocene monosulfonate)
RN 30604-81-0 HCA
CN 1H-Pyrrole, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 109-97-7
CMF C4 H5 N



IT **7664-93-9, Sulfuric acid**, uses
(voltammetry of platinum bare and modified with electrodeposited polypyrrole-ferrocene monosulfonate electrodes in **H2SO4** soln.)
RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IC ICM B01J035-00
CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 29, 38, 72
ST electrocatalyst polypyrrole ferrocene monosulfonate **hydrogen generation**
IT Conducting polymers
(catalysts for electrochem. **generation** of **hydrogen** contg.)
IT Electric potential
(for electrodeposition of polypyrrole-ferrocene monosulfonate as novel catalysts for electrochem. **generation** of **hydrogen**, on)
IT Current density
(for electrodeposition of polypyrrole-ferrocene monosulfonate as novel catalysts for electrochem. **generation** of **hydrogen**, on Pt)
IT Linear-sweep voltammetry
(of platinum bare and modified with electrodeposited polypyrrole-ferrocene monosulfonate electrodes in **H2SO4** soln.)
IT Doping
(of polypyrrole with ferrocene and toluene sulfonates in prepn. of catalysts for electrochem. **generation** of **hydrogen**)
IT Electrodeposition
(of polypyrrole-ferrocene monosulfonate as novel catalysts for electrochem. **generation** of **hydrogen**)
IT Chemically modified electrodes
(platinum with electrodeposited polypyrrole-ferrocene monosulfonate as novel catalysts for electrochem. **generation** of **hydrogen**)
IT 102-54-5, Ferrocene

(derivs.; catalysts for electrochem. **generation** of **hydrogen** contg. **conducting polymer** and ferrocene catalytic group)

IT 109-97-7, Pyrrole 34962-35-1, Ammonium Ferrocene sulfonate
(for electrodeposition of polypyrrole-ferrocene monosulfonate as novel catalysts for electrochem. **generation** of **hydrogen**, on Pt in soln. contg.)

IT **1333-74-0P**, Hydrogen, processes
(novel catalysts for electrochem. generation of)

IT **30604-81-0P**, Polypyrrole
(novel catalysts for electrochem. **generation** of **hydrogen** contg. polypyrrole-ferrocene monosulfonate)

IT 32218-90-9, Ferrocene monosulfonate
(novel catalysts for electrochem. **generation** of **hydrogen** contg. polypyrrole-ferrocene monosulfonate)

IT 7440-06-4, Platinum, uses
(of polypyrrole-ferrocene monosulfonate as novel catalysts for electrochem. **generation** of **hydrogen**, on)

IT **7664-93-9**, **Sulfuric acid**, uses
(voltammetry of platinum bare and modified with electrodeposited polypyrrole-ferrocene monosulfonate electrodes in **H2SO4** soln.)

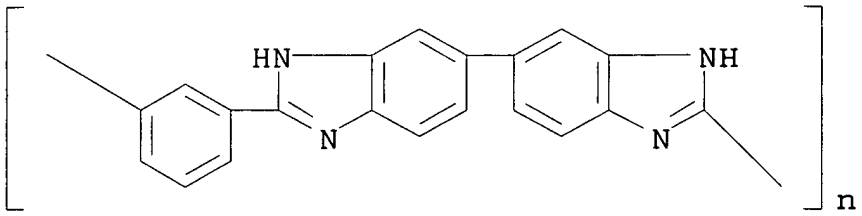
IT 16722-51-3, p-Toluene sulfonate, uses
(voltammetry of platinum bare and modified with electrodeposited polypyrrole-toluene sulfonate electrodes in **H2SO4** soln.)

L68 ANSWER 2 OF 5 HCA COPYRIGHT 2006 ACS on STN

138:26768 A quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes.** Li, Qingfeng; Hjuler, H. A.; Hasiotis, C.; Kallitsis, J. K.; Kontoyannis, C. G.; Bjerrum, N. J. (Materials Science Group, Department of Chemistry, Technical University of Denmark, Lyngby, DK-2800, Den.). Electrochemical and Solid-State Letters, 5(6), A125-A128 (English) **2002.** CODEN: ESLEF6. ISSN: 1099-0062. Publisher: Electrochemical Society.

AB From a **polymer electrolyte** blend of polybenzimidazole and sulfonated polysulfone, a **polymer electrolyte** membrane fuel cell was developed with an operational temp. up to 200°. Due to the high operational temp., the fuel cell can tolerate 1.0-3.0 vol.% CO in the fuel, compared to <100 ppm CO for the Nafion-based technol. at 80°. The high CO tolerance makes it possible to use the reformed hydrogen directly from a simple methanol reformer without further CO removal. That both the fuel cell and the methanol reformer operate at temps. around 200° opens the possibility for an integrated system. The resulting system is expected to exhibit high power d. and simple construction as well as efficient capital and operational cost.

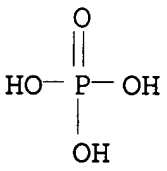
IT **25734-65-0**
(blends with sulfonated polysulfones and **phosphoric acid**; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)
RN 25734-65-0 HCA
CN Poly([5,5'-bi-1H-benzimidazole]-2,2'-diyl-1,3-phenylene) (9CI) (CA INDEX NAME)



IT **1333-74-0, Hydrogen**, uses
(**formation** and oxidn. of; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7664-38-2D, Phosphoric acid**, compd. with polybenzimidazole and sodium sulfonated polysulfone
(**polymer electrolyte** dopant; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST methanol reforming hydrogen fuel cell blend **polymer** membrane **electrolyte**; polybenzimidazole sulfonated polysulfone blend phosphate dopant electrolyte membrane
IT Reforming catalysts
(for methanol; quasi-direct methanol fuel cell system based on

blend **polymer** membrane **electrolytes**)

IT Electric current-potential relationship
(methanol reforming catalyst for fuel cell system based on blend **polymer** membrane **electrolytes**)

IT Fuel cell **electrolytes**
(**polymer electrolytes**; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

IT Fuel cell electrodes
Polymer electrolytes
(quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

IT **Polymer** blends
(**solid electrolytes**; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

IT Polysulfones, uses
(sulfonated, sodium salts, blend with polybenzimidazole and **phosphoric acid**; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

IT Carbon black, uses
(support for platinum anode catalyst, cast onto carbon paper; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

IT 7440-06-4, Platinum, uses
(anode catalyst, cast onto carbon paper; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

IT **25734-65-0**
(blends with sulfonated polysulfones and **phosphoric acid**; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

IT 291280-30-3, TGP-H 120
(carbon paper support for platinum-carbon catalyst; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

IT 630-08-0, Carbon monoxide, uses
(catalyst poison, tolerance to; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

IT 1314-13-2, Zinc oxide, uses 1344-28-1, Alumina, uses 7440-50-8, Copper, uses
(copptd.; methanol reforming catalyst for fuel cell system based on blend **polymer** membrane **electrolytes**)

IT **1333-74-0, Hydrogen**, uses
(**formation** and oxidn. of; quasi-direct methanol fuel cell system based on blend **polymer** membrane

electrolytes)

IT **7664-38-2D, Phosphoric acid**, compd. with polybenzimidazole and sodium sulfonated polysulfone (**polymer electrolyte** dopant; quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

IT 67-56-1, Methanol, uses (quasi-direct methanol fuel cell system based on blend **polymer** membrane **electrolytes**)

L68 ANSWER 3 OF 5 HCA COPYRIGHT 2006 ACS on STN

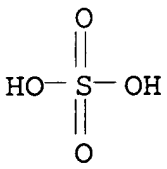
132:327051 Voltammetric study of the reduction and relaxation of poly(o-toluidine). Effect of the polymer thickness and the external electrolyte nature and concentration. Rodriguez Presa, M. J.; Posadas, D.; Florit, M. I. (Facultad de Ciencias Exactas, Instituto de Investigaciones Fisicoquimicas Teoricas y Aplicadas (INIFTA), Universidad Nacional de La Plata, La Plata, 1900, Argent.). Journal of Electroanalytical Chemistry, 482(2), 117-124 (English) **2000.** CODEN: JECHES. ISSN: 0368-1874. Publisher: Elsevier Science S.A..

AB The redn. and relaxation of poly(o-toluidine) (POT) was studied as a function of the wait time at different waiting potentials near the redn. potential of the polymer. The influence of the film thickness, the acid concn., and the ionic strength of the external electrolytic soln. on these processes were also studied. Two types of electrolytes were employed: perchloric and **sulfuric acid.** Both the redn. and the relaxation times depend on the proton concn. of the external electrolyte media and on the film thickness. They are independent of the ionic strength and, in a limited range, of the waiting potential. The voltammetric response of fully reduced and relaxed polymers shows that, at low sweep rates, the kinetics are controlled by slow ionic movements within the polymer. Expts. with medium exchange show that, once the polymer is fully reduced and relaxed, its state is independent of the compn. and concn. of the electrolyte in which this particular state was obtained. Furthermore, they also show that the shape of the voltammetric oxidn. profile depends exclusively on the compn. and concn. of the electrolyte in which the polymer is being oxidized. This means that the effect of the soln. compn. and concn. is manifested only through the participation of protons and anions in the mechanism of oxidn. of the polymer.

IT **7664-93-9, Sulfuric acid**, uses (cyclic voltammetry of gold electrode modified with poly(o-toluidine) film in soln. of)

RN 7664-93-9 HCA

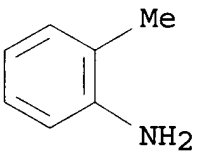
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **97917-08-3**, Poly(o-toluidine)
(effect of polymer thickness and external electrolyte nature and concn. on electroredn. and relaxation of)
RN 97917-08-3 HCA
CN Benzenamine, 2-methyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-53-4
CMF C7 H9 N



CC 72-2 (Electrochemistry)
Section cross-reference(s): 25, 56
IT Concentration (condition)
Electrolytes
Reduction, electrochemical
Relaxation
Thickness
(effect of **polymer** thickness and external electrolyte nature and concn. on electroredn. and relaxation of poly(o-toluidine))
IT Polymerization
(electrochem.; **formation** of poly(o-toluidine) film on gold electrode)
IT **7664-93-9**, **Sulfuric acid**, uses
(cyclic voltammetry of gold electrode modified with poly(o-toluidine) film in soln. of)
IT **97917-08-3**, Poly(o-toluidine)
(effect of polymer thickness and external electrolyte nature and concn. on electroredn. and relaxation of)

L68 ANSWER 4 OF 5 HCA COPYRIGHT 2006 ACS on STN
117:180420 Solid state electrochromic display based on **polymer**

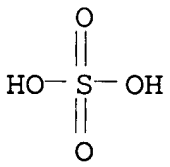
electrode-**polymer electrolyte** interface. Gomes, M. A. B.; Goncalves, D.; Pereira de Souza, E. C.; Valla, B.; Aegerter, M. A.; Bulhoes, L. O. S. (Dep. Quim., Univ. Fed. Sao Carlos, Sao Carlos, 13560, Brazil). Electrochimica Acta, 37(9), 1653-6 (English) **1992.** CODEN: ELCAAV. ISSN: 0013-4686.

AB The electropolymn. of o-toluidine and o-anisidine gave uniform electroactive polymer films which were analyzed by cyclic voltammetry, impedance, and UV-visible absorption spectra. These films exhibit a reversible electrochem. response during cyclic voltammetry expts. in aq., nonaq. and **polymer electrolytes.** Their electrochromic efficiency is high in aq. and nonaq. electrolytes but decreases in the **polymer electrolyte.** A solid-state cell having the configuration: ITO/TiO2-CeO2/LiN(SO2CF3)2-PEO complex/polymer/ITO, was assembled. The transmittance variation of this system between the oxidized and reduced state is .apprx.20% at 632.8 nm.

IT **7664-93-9, Sulfuric acid,** uses
(electrochem. polymn. of toluidine and anisidine and electrochromic properties of their polymers in solns. contg.)

RN 7664-93-9 HCA

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



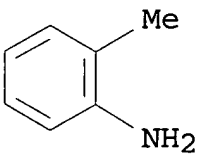
IT **97917-08-3,** Poly(o-toluidine)
(electrochem. **prepn.** and electrochromic properties of)

RN 97917-08-3 HCA

CN Benzenamine, 2-methyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-53-4
CMF C7 H9 N



CC 72-2 (Electrochemistry)
Section cross-reference(s): 35, 36, 73

IT **7664-93-9**, **Sulfuric acid**, uses
(electrochem. polymn. of toluidine and anisidine and electrochromic properties of their polymers in solns. contg.)
IT **97917-08-3**, Poly(**o**-toluidine) 99742-70-8, Poly(**o**-anisidine)
(electrochem. **prepn.** and electrochromic properties of)
IT 1306-38-3, Cerium dioxide, properties 13463-67-7, Titanium dioxide, properties
(electrochromic properties of polytoluidine and polyanisidine in **solid electrolyte** in system with)
IT 7439-93-2D, Lithium, PEO complex 25322-68-3, PEO 25322-68-3D, PEO, lithium complex
(electrochromic properties of polytoluidine and polyanisidine in **solid electrolyte** of)
IT 90076-65-6
(electrochromic properties of polytoluidine and polyanisidine in **solid electrolyte** of PEO with)

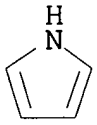
L68 ANSWER 5 OF 5 HCA COPYRIGHT 2006 ACS on STN
105:191844 Catalytic electrodes for oxygen reduction. Okabayashi, Katsuaki; Goto, Fumio; Abe, Katsuji (Toyota Central Research and Development Laboratories, Inc., Japan). Jpn. Kokai Tokkyo Koho JP 61040320 A2 **19860226** Showa, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1984-162174 19840731.
AB A polymeric electrode exhibiting high catalytic activity in redn. of **O** is **prepd.** by **electrolytic polymn.** of pyrrole in a soln. contg. a porphyrin deriv. (I) contg. sulfonic acid or carboxylic acid to form a I-doped polypyrrole on an anode before immersing the formed polymer into a soln. contg. a divalent metal and heating the treated polymer to change I to a metal porphyrin and heating. In this method, I is incorporated in the polymer at high concn. due to the high stability of the electrolyte soln. The product is useful in O sensors, biosensors, in a fuel batteries. Thus, **electrolytic polymn.** was conducted by passing the current through an aq. soln. contg. 0.001 M tetraphenylporphyrin trisulfonate (II) and 0.1 M pyrrole at 0.5 mA/cm2 for 30 s to deposit II-doped polypyrrole on a glassy carbon electrode. The polymer-coated electrode was then immersed into a 0.1 M aq. Co2+ soln. at 60° for 1 min to give a modified electrode. When redn. of O was conducted by passing 0.1 mA/cm2 between electrodes (one of which comprised the above modified electrode) immersed into a 0.05 M aq. **H2SO4** soln. satd. with O (pH 1, 25°), the voltage value changed from 325 mV initially to 310 mV after 2 h, compared with 270 and 70 mA, resp., when doped polymer was prepd. by electrolysis of a soln. contg. pyrrole and metal-contg. II.
IT **30604-81-0P**
(metal porphyrin-doped, with high catalytic activity in

oxygen redn., **prepn.** of, by **electrolytic polymn.**, in manuf. of catalytic electrodes)

RN 30604-81-0 HCA
CN 1H-Pyrrole, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 109-97-7
CMF C4 H5 N



IC ICM C08G061-12
CC 35-7 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 72
ST polypyrrole doping phenylporphyin cobalt complex; **electrolytic polymn** pyrrole; catalytic electrode oxygen redn
IT Porphyrins
(metal complexes, polypyrrole doped with, with high catalytic activity in **oxygen** redn., **prepn.** of, by **electrolytic polymn.**, in manuf. of catalytic electrodes)
IT Reduction, electrochemical
(of **oxygen**, electrodes for, **prepn.** of)
IT Electric conductors
(polypyrrole doped with metal porphyrins, for catalytic electrodes for **oxygen** redn., **prepn.** of, by electrochem. polymn.)
IT **30604-81-0P**
(metal porphyrin-doped, with high catalytic activity in **oxygen** redn., **prepn.** of, by **electrolytic polymn.**, in manuf. of catalytic electrodes)
IT 104671-14-9P
(poly(pyrrole) doped with, with high catalytic activity in **oxygen** redn., **prepn.** of, by **electrolytic polymn.**, in manuf. of catalytic electrodes)
IT 13939-11-2P 13966-42-2P 14325-03-2P 14494-37-2P 14783-38-1P
14875-96-8P 15415-30-2P 15442-64-5P 15627-10-8P 19584-91-9P
30137-73-6P 30138-25-1P 70414-73-2P 73001-65-7P 78521-08-1P
81957-14-4P 85245-78-9P 101241-04-7P 104671-11-6P

105120-06-7P
(polypyrrole doped with, with high catalytic activity in **oxygen** redn., **prepn.** of, by **electrolytic polymn.**, in manuf. of catalytic electrodes)

=>

=> D L60 1-6 CBIB ABS HITSTR HITIND

L60 ANSWER 1 OF 6 HCA COPYRIGHT 2006 ACS on STN
140:96885 **Proton conductive solid polymer electrolyte** for electrochemical cell.
Komiya, Teruaki (Honda Giken Kabushiki Kaisha, Japan). Eur. Pat. Appl. EP 1381107 A2 20040114, 14 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK. (English). CODEN: EPXXDW. APPLICATION: EP 2003-254383 20030710. PRIORITY: JP 2002-201718 20020710.

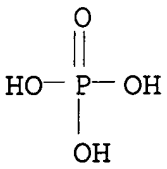
AB A material such as imidazole (nitrogen-contg. heterocyclic compd.), which has at least one lone pair, is dispersed in a basic solid polymer such as polybenzimidazole. The mole no. of imidazole per g of polybenzimidazole is less than 0.0014 mol, preferably less than 0.0006 mol. The basic solid polymer is impregnated with an acidic inorg. liq. such as **phosphoric acid** and **sulfuric acid** to prep. a **proton conductive solid polymer electrolyte.**

IT **9002-98-6**
(**proton conductive solid polymer electrolyte** for electrochem. cell)
RN 9002-98-6 HCA
CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

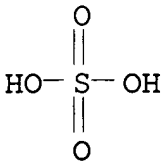
CM 1

CRN 151-56-4
CMF C2 H5 N

IT **7664-38-2, Phosphoric acid**, uses
7664-93-9, Sulfuric acid, uses
(**proton conductive solid polymer electrolyte** for electrochem. cell)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P, Hydrogen, preparation**
7782-44-7P, Oxygen, preparation
(proton conductive solid
polymer electrolyte for electrochem. cell)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

IC ICM H01M010-40
ICS H01M006-18; C08G073-18
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72
ST electrochem cell **proton conductive solid polymer electrolyte**; fuel cell **proton conductive solid polymer electrolyte**; **electrolyzer proton conductive solid polymer electrolyte**
IT Azines
(diazine; proton conductive solid
polymer electrolyte for electrochem. cell)
IT Heterocyclic compounds

(nitrogen; **proton conductive solid polymer electrolyte** for electrochem. cell)

IT Electrochemical cells
Electrolytic cells
Fuel cell **electrolytes**
Solid electrolytes
(**proton conductive solid polymer electrolyte** for electrochem. cell)

IT Polybenzimidazoles
(**proton conductive solid polymer electrolyte** for electrochem. cell)

IT Ionic **conductivity**
(**proton; proton conductive solid polymer electrolyte** for electrochem. cell)

IT Fuel cells
(**solid electrolyte; proton conductive solid polymer electrolyte** for electrochem. cell)

IT 7732-18-5, Water, processes
(**electrolysis; proton conductive solid polymer electrolyte** for electrochem. cell)

IT 91-22-5, Quinoline, uses 110-86-1, Pyridine, uses 119-65-3, IsoQuinoline 120-72-9, Indole, uses 120-73-0, Purine 288-13-1, Pyrazole 288-32-4, Imidazole, uses **9002-98-6** 9003-47-8, Polyvinylpyridine 25232-42-2, Polyvinylimidazole 25233-30-1 25823-41-0, Poly(1-vinylpyrazole) 32109-42-5, Poly(1H-benzimidazole-2,5-diyl) 50641-39-9 131714-35-7
(**proton conductive solid polymer electrolyte** for electrochem. cell)

IT **7664-38-2, Phosphoric acid**, uses
7664-93-9, Sulfuric acid, uses
(**proton conductive solid polymer electrolyte** for electrochem. cell)

IT **1333-74-0P, Hydrogen, preparation**
7782-44-7P, Oxygen, preparation
(**proton conductive solid polymer electrolyte** for electrochem. cell)

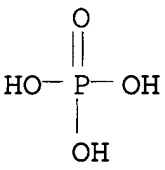
L60 ANSWER 2 OF 6 HCA COPYRIGHT 2006 ACS on STN
129:61705 Bipolar electrochemical charge storage devices and their fabrication. Li, Changming; Jung, Richard H.; Nerz, John (Motorola, Inc., USA). U.S. US 5768090 A **19980616**, 9 pp. (English). CODEN: USXXAM. APPLICATION: US 1996-755876 19961202.

AB An electrochem. capacitor cell is provided with 1st and 2nd electrodes, and a **solid polymer electrolyte** is disposed between them. The electrodes may be

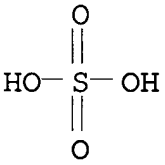
either the same or different materials and may be fabricated from Ru, Ir, Co, W, V, Fe, Mo, Hf, Ni, Ag, Zn, and combinations thereof. The **solid polymer electrolyte** is in intimate contact with both electrodes, and is made from a polymeric support structure having an electrolyte active species dispersed in it. Also a method of fabricating a bipolar electrochem. charge storage device by assembling at least the 1st and 2nd bipolar subassemblies together with the 2nd layer of electrode active material for the 1st bipolar subassembly in direct contact with the 1st layer of electrode active material for the 2nd bipolar subassembly without a current collector disposed between them is described.

IT **7664-38-2**, **Phosphoric acid**, processes
7664-93-9, **Sulfuric acid**, processes
9002-98-6
(fabrication of bipolar electrochem. charge storage devices contg.)

RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



RN 9002-98-6 HCA
CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 151-56-4
CMF C2 H5 N

IC ICM H01G009-00
INCL 361523000
CC 76-10 (Electric Phenomena)
Section cross-reference(s): 38, 52, 72
ST bipolar electrochem charge storage device manuf; **polymer electrolyte** electrochem capacitor manuf
IT Electrolytes
(fabrication of bipolar electrochem. charge storage devices having **polymer electrolytes**)
IT Polymers, processes
(fabrication of bipolar electrochem. charge storage devices having **polymer electrolytes**)
IT 1310-58-3, Potassium hydroxide, processes 1310-65-2, Lithium hydroxide (LiOH) 1310-73-2, Sodium hydroxide (NaOH), processes 7439-88-5, Iridium, processes 7439-89-6, Iron, processes 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes 7440-18-8, Ruthenium, processes 7440-22-4, Silver, processes 7440-33-7, Tungsten, processes 7440-48-4, Cobalt, processes 7440-58-6, Hafnium, processes 7440-62-2, Vanadium, processes 7440-66-6, Zinc, processes 7647-01-0, **Hydrogen** chloride, processes **7664-38-2**, **Phosphoric acid**, processes **7664-93-9**, **Sulfuric acid**, processes 7697-37-2, Nitric acid, processes 9002-89-5, Polyvinyl alcohol **9002-98-6** 9003-01-4, Polyacrylic acid 9003-05-8, Polyacrylamide 9003-06-9, Acrylamide-acrylic acid copolymer 9003-35-4, Phenol-formaldehyde copolymer 9003-39-8, Poly(vinyl pyrrolidone) 9003-47-8, Poly(vinyl pyridine) 12036-10-1, Ruthenium oxide (RuO2) 24981-14-4, Poly(vinyl fluoride) 25249-16-5, Poly(2-hydroxyethyl methacrylate) 25322-68-3, Polyethylene glycol 28390-30-9 29011-20-9 85885-77-4, Cerium hydroxide (CeOH)
(**fabrication** of bipolar electrochem. charge storage devices contg.)

L60 ANSWER 3 OF 6 HCA COPYRIGHT 2006 ACS on STN
127:18475 **Proton-conductive polymer solid electrolytes.** Bessho, Keiichi; Teramoto, Toshio; Ishikawa, Katsuhiro (Japan Synthetic Rubber Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 09087510 A2 **19970331** Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-268064 19950922.
AB The title electrolytes, useful for primary, secondary, and fuel

batteries, display devices, sensors, capacitors, ion-exchange membranes, etc. (no data), are prepd. from (a) introducing sulfone or phosphoric group to arom. or N-contg. ring polymers with heat resistance >250° [e.g., reaction **product** of (**O**-p-C6H4-p-C6H4-CO2-p-C6H4)n and **H2SO4**] and (b) **polymer** with **proton cond.** at relative humidity 50% 10-5 s/cm, polymer with water absorptivity >1%, and/or polymer with glass transition temp. <0° [e.g., polyoxyethylene, **polyethyleneimine**, poly(vinyl alc.)].

IT **9002-98-6**
(proton-conductive polymer solid electrolytes)

RN 9002-98-6 HCA

CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

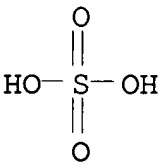
CM 1

CRN 151-56-4
CMF C2 H5 N

IT **7664-93-9**, **Sulfuric acid**, reactions
(proton-conductive polymer solid electrolytes)

RN 7664-93-9 HCA

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IC ICM C08L071-00
ICS C08L065-00; G01N027-406; H01G009-028; H01M006-18; H01M008-02; H01M010-40

CC 37-6 (Plastics Manufacture and Processing)

ST **proton conductive polymer solid electrolyte**; sulfonated polyoxyphenylene polycarbonate proton conductor; polyoxyethylene **proton conductive solid electrolyte**; **polyethyleneimine proton conductive solid electrolyte**; polyvinyl alc **proton**

conductive solid electrolyte
IT **Conducting polymers**
(ionic; **proton-conductive polymer solid electrolytes**)
IT Polyoxyphenylenes
Polyoxyphenylenes
(polyester-; **proton-conductive polymer solid electrolytes**)
IT Polyesters, reactions
Polyesters, reactions
(polyoxyphenylene-; **proton-conductive polymer solid electrolytes**)
IT Sulfonation
(**proton-conductive polymer solid electrolytes**)
IT Polyamines
Polyoxyalkylenes, uses
(**proton-conductive polymer solid electrolytes**)
IT Polybenzimidazoles
(**proton-conductive polymer solid electrolytes**)
IT 25734-65-0DP, reaction product with 1,3-propanesultone
189640-60-6DP, reaction product with 1,3-propanesultone
189768-11-4DP, reaction product with **sulfuric acid**
189768-12-5DP, reaction product with **sulfuric acid**
(**proton-conductive polymer solid electrolytes**)
IT 9002-89-5, Poly(vinyl alcohol) **9002-98-6** 25322-68-3
26913-06-4, Poly[imino(1,2-ethanediyl)]
(**proton-conductive polymer solid electrolytes**)
IT 1120-71-4D, 1,3-Propanesultone, reaction products with polybenzimidazoles **7664-93-9**, **Sulfuric acid**, reactions 16672-87-0 25734-65-0 91442-06-7 189768-12-5
(**proton-conductive polymer solid electrolytes**)

L60 ANSWER 4 OF 6 HCA COPYRIGHT 2006 ACS on STN
111:42849 Hydrogen separation and electricity generation using novel electrolyte membranes. Polak, Anthony J.; Petty-Weeks, Sandra (Allied-Signal, Inc., USA). U.S. US 4797185 A **19890110**, 12 pp. Cont. of U. S. Ser. No. 756,889, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1987-70620 19870706. PRIORITY: US 1984-687351 19841228; US 1985-756889 19850719.
AB An app. for performing an electrochem. process involving a gaseous mixt. having a component which, in the presence of a catalytic

agent, is capable of dissocg. to yield H ions or of combining with H ions, comprises a thin-film macroscopically homogeneous polymer blend membrane, a membrane housing comprising a 1st and a 2nd gas chamber sepd. by the membrane, 2 sep. portions of catalytic agent effective to promote the dissocn. and combination, and means for forming an elec. connection in operative contact with the catalytic agent. The app. comprises also means to supply fuel gas to 1 and oxidant gas to the other of the 2 chambers, or to supply the gaseous mixt. to 1 and remove H from the other chamber. The membrane possessing a high protonic cond. and formed by removing the solvent from a soln. of a **phosphoric acid** and a polymer contains .apprx.10-70% H2PO3, HPO3, **H3PO4**, H4P2O7, and polyphosphoric acid and .apprx.30-90% polymer such as poly(vinyl alc.), poly(vinyl fluoride), polyethylene glycol, etc. In 1 version, the membrane may be formed into a hollow fiber having elec. conductive particles with catalyst embedded in the fiber walls; a multiplicity of such fibers may be used to **form** a **H** sepn. device.

IT **9002-98-6**, Polyethylenimine
(membranes from blends contg. phosphorus acids and, for fuel cells and hydrogen sepn.)

RN 9002-98-6 HCA

CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

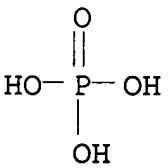
CM 1

CRN 151-56-4
CMF C2 H5 N

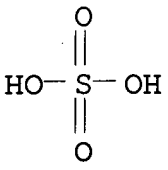
IT **7664-38-2**, **Phosphoric acid**, uses and miscellaneous **7664-93-9**, **Sulfuric acid**, uses and miscellaneous
(membranes from blends contg. polymer and, for fuel cells and hydrogen sepn.)

RN 7664-38-2 HCA

CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P, Hydrogen, preparation**
(sepn. of, membranes from phosphorus acid-polymer blends for)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

IC ICM C25B001-02
ICS C25B009-00
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49, 72
ST hydrogen sepn acid polymer membrane; fuel cell acid polymer membrane; **phosphoric acid** polymer membrane cond; **cond protonic** acid **polymer** membrane
IT 9002-89-5, Poly(vinyl alcohol) **9002-98-6**, Polyethylenimine 9003-01-4, Poly(acrylic acid) 9003-05-8, Poly(acrylamide) 9003-43-4, Poly(vinyl pyrrolidine) 9003-47-8, Poly(vinyl pyridine) 9004-35-7, Cellulose acetate 24981-14-4, Poly(vinyl fluoride) 25189-55-3, Poly(N-isopropyl acrylamide) 25322-68-3, Poly(ethylene glycol) 25805-17-8, Poly(ethyloxazoline) 26101-52-0, Poly(vinyl sulfonic acid) 26793-34-0, Poly(N,N-dimethyl acrylamide) 26913-06-4, Polyethylenimine
(membranes from blends contg. phosphorus acids and, for fuel cells and hydrogen sepn.)
IT 2466-09-3, Pyrophosphoric acid **7664-38-2**, **Phosphoric acid**, uses and miscellaneous **7664-93-9**, **Sulfuric acid**, uses and miscellaneous 7803-60-3, Hypophosphoric acid 10343-62-1, Metaphosphoric acid
(membranes from blends contg. polymer and, for fuel cells and hydrogen sepn.)
IT **1333-74-0P, Hydrogen, preparation**
(sepn. of, membranes from phosphorus acid-polymer blends for)

L60 ANSWER 5 OF 6 HCA COPYRIGHT 2006 ACS on STN

110:138716 Hydrogen separation and electricity generation using novel three-component membrane. Young, Ping; Polak, Anthony J. (Allied-Signal, Inc., USA). U.S. US 4795536 A **19890103**, 13 pp. Cont. of U.S. Ser. No. 753,495, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1987-70622 19870706. PRIORITY: US 1985-753495 19850710.

AB An app. for performing an electrochem. process involving a gaseous mixt. having a component which in presence of a catalytic agent is capable of dissocg. to yield H+ or of combining with H+ comprises a thin-film polymer-blend membrane, a membrane housing comprising a 1st and a 2nd gas chamber sepd. by the membrane, 2 sep. portions of catalytic agent effective to promote the dissocn. and combination, and means for forming elec. connection in operative contact with the catalytic agent. The app. comprises also means to supply fuel gas to 1 and oxidant gas to the other of the 2 chambers, or to supply the gaseous mixt. to 1 and remove H from the other of the 2 chambers. The membrane possessing a high **H+** cond. and **formed** by removing the solvent from a soln. of a blend of 3 components: H2PO3, HPO3, **H3PO4**, H4P2O7, and polyphosphoric acid .apprx.10-50; an org. polymer such as poly(vinyl alc.), poly(vinyl fluoride), etc. .apprx.40-80; and a poly(org. acid) such as poly(acrylic acid) .apprx.10-40 mol%. For increased strength, a membrane may be composited with or attached to a porous support. In 1 version, elec. conductive particles with catalyst are partly embedded in the membrane to **form** a **H** sepg. device.

IT **9002-98-6**, Polyethylenimine
(electrolyte membranes from blends contg. **phosphoric acid**-poly(org. acid)-, for fuel cells and hydrogen sepn.)

RN 9002-98-6 HCA

CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

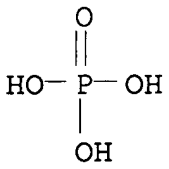
CM 1

CRN 151-56-4
CMF C2 H5 N

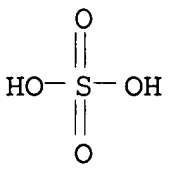
IT **7664-38-2**, **Phosphoric acid**, uses and miscellaneous **7664-93-9**, **Sulfuric acid**, uses and miscellaneous
(electrolyte membranes from blends contg. polymer-poly(org. acid)-, for fuel cells and hydrogen sepn.)

RN 7664-38-2 HCA

CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P, Hydrogen, preparation**
(sepn. of, electrolyte membranes from **phosphoric acid**-polymer-poly(org. acid) for)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

IC ICM C25B001-02
ICS C25B009-00
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49, 72
ST hydrogen electrolytic sepn composite electrolyte; fuel cell **solid electrolyte** composite; **phosphoric acid polymer electrolyte** composite; polyorg acid **polymer electrolyte** composite; cond **solid electrolyte** composite
IT Fuel cells
(electrolyte membranes for, **phosphoric acid**-polymer-poly(org. acid) blend)
IT 9002-89-5, Poly(vinyl alcohol) **9002-98-6**, Polyethylenimine 9004-35-7, Cellulose acetate 24981-14-4, Poly(vinyl fluoride) 25322-68-3, Polyethylene glycol
(electrolyte membranes from blends contg. **phosphoric acid**-poly(org. acid)-, for fuel cells and hydrogen sepn.)
IT 9003-01-4, Poly(acrylic acid) 25087-26-7, Poly(methacrylic acid) 50851-57-5, Poly(styrenesulfonic acid)

(electrolyte membranes from blends contg. **phosphoric acid**-polymer-, for fuel cells and hydrogen sepn.)

IT 2466-09-3, Pyrophosphoric acid **7664-38-2**, **Phosphoric acid**, uses and miscellaneous **7664-93-9**, **Sulfuric acid**, uses and miscellaneous 7803-60-3, Hypophosphoric acid 10343-62-1, Metaphosphoric acid
(electrolyte membranes from blends contg. polymer-poly(org. acid)-, for fuel cells and hydrogen sepn.)

IT **1333-74-0P**, **Hydrogen**, **preparation**
(sepn. of, electrolyte membranes from **phosphoric acid**-polymer-poly(org. acid) for)

L60 ANSWER 6 OF 6 HCA COPYRIGHT 2006 ACS on STN

107:62049 Electrochemical method and apparatus using **proton-conducting polymers.** Zupancic, Joseph J.; Swedo, Raymond J.; Petty-Weeks, Sandra L. (UOP Inc., USA). U.S. US 4664761 A **19870512**, 10 pp. (English). CODEN: USXXAM. APPLICATION: US 1985-814339 19851227.

AB An interpenetrating polymer-network membrane for use as **solid electrolyte** in fuel cells or sepn. of H from gas mixt. or other electrochem. processes involving H+ contains a host polymer blend of **H3PO4** or **H2SO4** mixed with a polymer or copolymer of ethyleneimine, acrylic acid, ethylene oxide, 2-ethyl-2-oxazoline, acrylamide, N-substituted acrylamide, 4-vinylpyridine, methacrylic acid, N-vinylimidazole, vinylsulfonic acid, 2-vinylpyridine, poly(hydroxyethylene), or PhOH-HCHO resin and a guest polymer of acrylic acid, methacrylic acid, acrylamide, methacrylamide, 2-acrylamido-2-methylpropanesulfonic acid, N-benzylacrylamide, N-ethylmethylacrylamide, N-phenylacrylamide, or N-phenylmethacrylamide crosslinked by methylenebisacrylamide, N,N-diallylacryllamide, m-xylenebisacrylamide, or N,N'-trimethylenebisacrylamide where the repeating units of the guest polymer is different from that of the host polymer. The membrane is coated with catalysts on opposite sides and used as partitioner to sep. 2 gas chambers in an app. An aq. soln. of **H3PO4** and poly(vinyl alc.) and an aq. soln. of methylenebisacrylamide and methacrylic acid were mixed, poured into a Petri dish, H2O was evapd., the film was irradiated by a 175-keV electron beam at 5 Mrad/pass from 1 side, cut into a 1"-diam. disk, and sputtered to form 400-Å Pt layers on both sides. This disk had a resistivity of 2 + 106 Ω-cm and a H flux of 1.8 + 10-5 ft3/ft2-h.

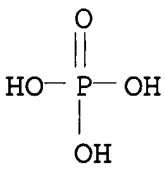
IT **1333-74-0P**, **Hydrogen**, **preparation**
(sepn. of, from gas mixts. by electrochem. processes, **solid polymer electrolytes** for)

RN 1333-74-0 HCA

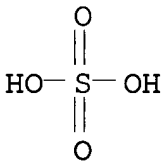
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7664-38-2, Phosphoric acid**, uses and miscellaneous **7664-93-9, Sulfuric acid**, uses and miscellaneous **9002-98-6**
(**solid electrolytes** contg., **proton-conductive**, for fuel cells and other electrochem. app)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



RN 9002-98-6 HCA
CN Aziridine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 151-56-4
CMF C2 H5 N

IC ICM C25B001-02
ICS H01M008-10
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 47, 49, 72
ST polyvinyl alc **phosphoric acid** electrolyte;

polymethacrylic acid **solid electrolyte;**
fuel cell **polymer solid electrolyte;**
hydrogen sepn **polymer solid electrolyte**

IT Fuel cells
(**electrolytes** for, **solid polymer**)

IT 30421-16-0, Methacrylic acid-methylenebisacrylamide copolymer
(crosslinked, **solid electrolytes** contg., **proton-conductive**, for fuel cells and other electrochem. app.)

IT **1333-74-0P, Hydrogen, preparation**
(sepn. of, from gas mixts. by electrochem. processes, **solid polymer electrolytes** for)

IT **7664-38-2, Phosphoric acid**, uses and miscellaneous **7664-93-9, Sulfuric acid**, uses and miscellaneous 9002-89-5 **9002-98-6** 9003-01-4, Poly(acrylic acid) 9003-05-8 9003-35-4, Formaldehyde phenol copolymer 25014-15-7, Poly(2-vinylpyridine) 25087-26-7, Poly(methacrylic acid) 25232-41-1, Poly(4-vinylpyridine) 25232-42-2, Poly(N-vinylimidazole) 25322-68-3, Poly(ethylene oxide) 25805-17-8, Poly(2-ethyl-2-oxazoline) 26101-52-0, Poly(vinyl sulfonic acid)
(**solid electrolytes** contg., **proton-conductive**, for fuel cells and other electrochem. app)

=>

=> D L62 1-8 CBIB ABS HITSTR HITIND

L62 ANSWER 1 OF 8 HCA COPYRIGHT 2006 ACS on STN
140:96885 **Proton conductive solid polymer electrolyte** for electrochemical cell.
Komiya, Teruaki (Honda Giken Kabushiki Kaisha, Japan). Eur. Pat. Appl. EP 1381107 A2 20040114, 14 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK. (English). CODEN: EPXXDW. APPLICATION: EP 2003-254383 20030710. PRIORITY: JP 2002-201718 20020710.

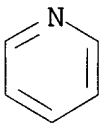
AB A material such as imidazole (nitrogen-contg. heterocyclic compd.), which has at least one lone pair, is dispersed in a basic solid polymer such as polybenzimidazole. The mole no. of imidazole per g of polybenzimidazole is less than 0.0014 mol, preferably less than 0.0006 mol. The basic solid polymer is impregnated with an acidic inorg. liq. such as **phosphoric acid** and **sulfuric acid** to prep. a **proton conductive solid polymer electrolyte.**

IT **9003-47-8**, Polyvinylpyridine **25823-41-0**, Poly(1-vinylpyrazole)
(**proton conductive solid polymer electrolyte** for electrochem. cell)

RN 9003-47-8 HCA
CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1337-81-1
CMF C7 H7 N
CCI IDS

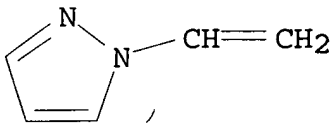


D1—CH=CH$_2$

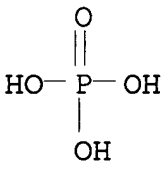
RN 25823-41-0 HCA
CN 1H-Pyrazole, 1-ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

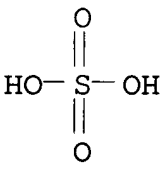
CRN 20173-98-2
CMF C5 H6 N2



IT **7664-38-2, Phosphoric acid**, uses
7664-93-9, Sulfuric acid, uses
(proton conductive solid polymer electrolyte for electrochem. cell)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P, Hydrogen, preparation**
7782-44-7P, Oxygen, preparation
(proton conductive solid polymer electrolyte for electrochem. cell)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

IC ICM H01M010-40
ICS H01M006-18; C08G073-18
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72
ST electrochem cell **proton conductive solid polymer electrolyte**; fuel cell **proton conductive solid polymer electrolyte**; **electrolyzer proton conductive solid polymer electrolyte**
IT Azines
(diazine; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT Heterocyclic compounds
(nitrogen; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT Electrochemical cells
Electrolytic cells
Fuel cell **electrolytes**
Solid electrolytes
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT Polybenzimidazoles
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT Ionic **conductivity**
(**proton**; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT Fuel cells
(**solid electrolyte**; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT 7732-18-5, Water, processes
(**electrolysis**; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT 91-22-5, Quinoline, uses 110-86-1, Pyridine, uses 119-65-3, IsoQuinoline 120-72-9, Indole, uses 120-73-0, Purine 288-13-1, Pyrazole 288-32-4, Imidazole, uses 9002-98-6 **9003-47-8**, Polyvinylpyridine 25232-42-2, Polyvinylimidazole 25233-30-1 **25823-41-0**, Poly(1-vinylpyrazole) 32109-42-5, Poly(1H-benzimidazole-2,5-diyl) 50641-39-9 131714-35-7
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT **7664-38-2**, **Phosphoric acid**, uses
7664-93-9, **Sulfuric acid**, uses

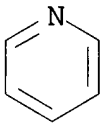
(**proton conductive solid**
polymer electrolyte for electrochem. cell)
IT **1333-74-0P, Hydrogen, preparation**
7782-44-7P, Oxygen, preparation
(**proton conductive solid**
polymer electrolyte for electrochem. cell)

L62 ANSWER 2 OF 8 HCA COPYRIGHT 2006 ACS on STN
139:150738 Acid-base **proton conducting**
polymer blend membrane for fuel cells. Nam, Kiehyun; Xu, Helen; Cao, Shuguang; Olmeijer, David; Servaites, Jon; Wang, Ying (Polyfuel, Inc., USA). PCT Int. Appl. WO 2003062493 A1 20030731, 38 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US2361 20030123. PRIORITY: US 2002-2002/PV351445 20020123.
AB The acid-base **proton conducting polymer** blend membrane comprises a first acidic polymer having acidic subunits, a second basic polymer having basic subunits, and a third polymer contg. one or more functional units for improving membrane cond., flexibility, water remaining ability, dimension stability, and methanol crossover. In one embodiment, the acid-base polymer blend membrane of the present invention comprises a first acidic polymer having acidic subunits, a second basic polymer having basic subunits, wherein at least one of the first acidic and second basic polymer comprises one or more functional units to improve the properties of the membrane. The functional units include hydrophilic units, adhesion promoter units, methanol block units, dimensional stabilizer units, and flexible units. Optionally, interpenetrating polymer networks are added to the blends to improve the membrane dimensional stability, and rubbers are optionally added to the blends to improve the membrane mech. properties and reduce methanol permeability. A typical membrane was manufd. by adding 0.2 g NH3 to 12 g AcNMe2 contg. 0.7 g sulfonated PEEK, adding 0.3 g styrene-4-vinylpyridine block copolymer (no.-av. mol. wt. vinylpyridine block 80,000, no.-av. mol. wt. styrene block 160,000), casting, drying, soaking 16 h in 1.5 M **H2SO4**, and rinsing in water.
IT **9003-47-8**, Polyvinylpyridine
(base **polymer**; acid-base **proton**
conducting polymer blend membrane with good
mech. properties, hydrophilicity, and decreased methanol

permeability for fuel cells)
RN 9003-47-8 HCA
CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1337-81-1
CMF C7 H7 N
CCI IDS



D1— CH═ CH_2

IC ICM C25B001-02
ICS C25B013-08; H01M008-10
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 52
ST acid base **proton conducting polymer** blend membrane fuel cell; styrene vinylpyridine block copolymer blend proton conducting membrane; ammonium sulfonated PEEK blend acid base proton conducting membrane
IT **Polymer** blends
(acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)
IT Synthetic rubber, uses
(acrylonitrile, mech.-property improving component; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)
IT Polybenzimidazoles
(base **polymer**; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)
IT Silicone rubber, uses
(di-Me, aminopropyl group-terminated, mech.-property improving component; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Fluoro rubber
(hexafluoropropene-vinylidene fluoride, Kynar Flex, mech.-property improving component; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Interpenetrating polymer networks
(mech.-property improving component; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Synthetic rubber, uses
(phosphazene, trifluoroethoxy, mech.-property improving component; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Polysulfones, uses
(polyether-, acid **polymer**; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Polyimides, uses
Polysulfones, uses
(polyether-, sulfonated, acid **polymer**; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Polyketones
(polyether-, sulfonated, ammonium salts, acid **polymer**; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Polyethers, uses
(polyimide-, sulfonated, acid **polymer**; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Polyethers, uses
(polyketone-, sulfonated, ammonium salts, acid **polymer**; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Polyethers, uses
(polysulfone-, acid **polymer**; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Polyethers, uses
(polysulfone-, sulfonated, acid **polymer**; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Ionic **conductors**
(**proton**; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Fluoropolymers, uses
(rubber, mech.-property improving component; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Fuel cells
(**solid electrolyte**, proton-exchange membranes; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT Fluoro rubber
(vinylidene fluoride, mech.-property improving component; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT 97917-34-5, A 12
(DMS-A 12, mech.-property improving component; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT 31694-16-3D, PEEK, sulfonated, ammonium salts
(acid **polymer**; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT 67-56-1, Methanol, miscellaneous
(acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT 9003-53-6, Polystyrene
(addnl. hydrophobic component; acid-base **proton conducting polymer** blend membrane with good mech. properties, hydrophilicity, and decreased methanol permeability for fuel cells)

IT **9003-47-8**, Polyvinylpyridine 25232-42-2, Polyvinylimidazole 32236-74-1, Acrylonitrile-4-vinylpyridine copolymer 69638-75-1, Acrylic acid-styrene-4-vinylpyridine

copolymer 107082-95-1, Styrene-4-vinylpyridine block copolymer
(base **polymer**; acid-base **proton**
conducting polymer blend membrane with good
mech. properties, hydrophilicity, and decreased methanol
permeability for fuel cells)

IT 9003-39-8, PVP 25086-29-7, Styrene-vinylpyrrolidone copolymer
25086-89-9, Vinyl acetate-vinylpyrrolidone copolymer 25189-55-3,
Poly-N-isopropylacrylamide 25249-16-5, Poly-2-hydroxyethyl
methacrylate 29297-55-0, N-Vinylimidazole-N-vinylpyrrolidone
copolymer 30581-59-0, Dimethylaminoethyl methacrylate-
vinylpyrrolidone copolymer 31261-19-5, Acrylonitrile-N-
isopropylacrylamide copolymer 36521-72-9, Vinyl acetate-vinyl
alcohol-N-vinylpyrrolidone copolymer 200216-54-2,
Acrylonitrile-vinylimidazole copolymer
(hydrophilic component; acid-base **proton**
conducting polymer blend membrane with good
mech. properties, hydrophilicity, and decreased methanol
permeability for fuel cells)

IT 24968-99-8, Polyvinyl cinnamate
(mech.-property improving component; acid-base **proton**
conducting polymer blend membrane with good
mech. properties, hydrophilicity, and decreased methanol
permeability for fuel cells)

IT 78-10-4, TEOS 681-84-5, TMOS
(mech.-property improving component; acid-base **proton**
conducting polymer blend membrane with good
mech. properties, hydrophilicity, and decreased methanol
permeability for fuel cells)

IT 9002-89-5, Polyvinyl alcohol 9003-20-7, Polyvinyl acetate
24937-78-8, EVA 25213-24-5, Vinyl acetate-vinyl alcohol copolymer
37203-28-4, Vinyl acetate-vinylpyridine copolymer 61318-17-0,
Vinyl alcohol-vinylpyridine copolymer 570394-13-7, Vinyl
alcohol-vinyl acetate-vinylpyridine copolymer
(methanol-blocking component; acid-base **proton**
conducting polymer blend membrane with good
mech. properties, hydrophilicity, and decreased methanol
permeability for fuel cells)

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
24937-79-9, Polyvinylidene fluoride 25014-41-9, PAN 28212-50-2,
Polybis(trifluoroethoxy)phosphazene
(rubber, mech.-property improving component; acid-base
proton conducting polymer blend
membrane with good mech. properties, hydrophilicity, and
decreased methanol permeability for fuel cells)

L62 ANSWER 3 OF 8 HCA COPYRIGHT 2006 ACS on STN
132:323960 Materials for use in **proton-conducting**
polymer electrolytes for electrochromic devices,

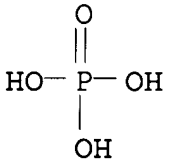
rechargeable batteries and fuel cells. Brochu, Fernand; Duval, Michel (Hydro-Quebec, Can.). PCT Int. Appl. WO 2000028611 A1 **20000518**, 21 pp. DESIGNATED STATES: W: CA, JP; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1999-CA1022 19991102. PRIORITY: US 1998-186138 19981105.

AB Organophosphoric materials obtained from the reaction of **orthophosphoric acid** with various org. reagents, including acetonitrile, acrylonitrile, a low mol. wt. ether, a low mol. wt. alc., or mixts. thereof are materials for use in **proton-conducting polymer electrolytes.** The novel organophosphoric materials have the beneficial effect of preventing the degrdn. of the polymers while still providing excellent ionic cond.

IT **7664-38-2D, Orthophosphoric acid,** reaction product with acetonitrile **7664-93-9D, Sulfuric acid,** reaction product with org. reagent, uses **9003-47-8,** Polyvinylpyridine (materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)

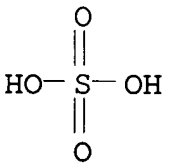
RN 7664-38-2 HCA

CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



RN 9003-47-8 HCA

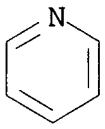
CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1337-81-1

CMF C7 H7 N

CCI IDS



D1— CH═ CH_2

IC ICM H01M008-10
ICS H01M010-40; H01M006-18; G02F001-15; C07F009-09
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST organophosphoric material **proton conducting polymer electrolyte**; electrochromic device organophosphoric material electrolyte; battery organophosphoric material electrolyte; fuel cell organophosphoric material electrolyte
IT Polysulfones, uses
(arom.; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT Alcohols, uses
Ethers, uses
(low mol. wt., reaction product with inorg. acid; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT Battery electrolytes
Conducting polymers
Electrochromic devices
Fuel cell electrolytes
(materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT Acrylic polymers, uses
Fluoropolymers, uses
Polyamides, uses
Polybenzimidazoles
Polyethers, uses
Polyimides, uses
Polythioarylenes
(materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)

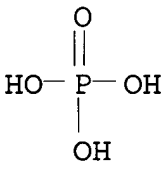
IT Sulfonic acids, uses
(perfluorosulfonic acid polymers; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT Fluoropolymers, uses
Fluoropolymers, uses
(sulfo-contg.; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT 7631-86-9, Aerosil, uses
(colloidal; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT 9010-79-1, Ethylene-propylene copolymer
(fluorinated; materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)
IT 75-05-8D, Acetonitrile, reaction product with **orthophosphoric acid**, uses 107-13-1D, Acrylonitrile, reaction product with **orthophosphoric acid** 7601-90-3D, Perchloric acid, reaction product with org. reagent, uses **7664-38-2D, Orthophosphoric acid**, reaction product with acetonitrile **7664-38-2D, Orthophosphoric acid**, reaction product with org. reagent **7664-93-9D, Sulfuric acid**, reaction product with org. reagent, uses 9002-89-5, Pva 9003-05-8, Polyacrylamide 9003-20-7, Polyvinyl acetate 9003-39-8 **9003-47-8**, Polyvinylpyridine 24937-79-9, Pvdf 57271-36-0, Butylene-ethylene-styrene copolymer 90622-00-7D, Benzene, ethenyl-, trifluoro deriv., sulfonic acid deriv. 105809-46-9D, Polypyrazole, arom. deriv.
(materials for use in **proton-conducting polymer electrolytes** for electrochromic devices, rechargeable batteries and fuel cells)

L62 ANSWER 4 OF 8 HCA COPYRIGHT 2006 ACS on STN
129:61705 Bipolar electrochemical charge storage devices and their fabrication. Li, Changming; Jung, Richard H.; Nerz, John (Motorola, Inc., USA). U.S. US 5768090 A **19980616**, 9 pp. (English). CODEN: USXXAM. APPLICATION: US 1996-755876 19961202.
AB An electrochem. capacitor cell is provided with 1st and 2nd electrodes, and a **solid polymer electrolyte** is disposed between them. The electrodes may be either the same or different materials and may be fabricated from Ru, Ir, Co, W, V, Fe, Mo, Hf, Ni, Ag, Zn, and combinations thereof. The **solid polymer electrolyte** is in intimate contact with both electrodes, and is made from a polymeric

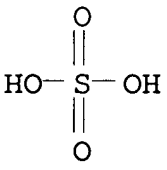
support structure having an electrolyte active species dispersed in it. Also a method of fabricating a bipolar electrochem. charge storage device by assembling at least the 1st and 2nd bipolar subassemblies together with the 2nd layer of electrode active material for the 1st bipolar subassembly in direct contact with the 1st layer of electrode active material for the 2nd bipolar subassembly without a current collector disposed between them is described.

IT **7664-38-2**, **Phosphoric acid**, processes
7664-93-9, **Sulfuric acid**, processes
9003-47-8, Poly(vinyl pyridine)
(fabrication of bipolar electrochem. charge storage devices contg.)

RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



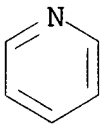
RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



RN 9003-47-8 HCA
CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1337-81-1
CMF C7 H7 N
CCI IDS



D1— CH═ CH_2

IC ICM H01G009-00
INCL 361523000
CC 76-10 (Electric Phenomena)
Section cross-reference(s): 38, 52, 72
ST bipolar electrochem charge storage device manuf; **polymer electrolyte** electrochem capacitor manuf
IT Electrolytes
(fabrication of bipolar electrochem. charge storage devices having **polymer electrolytes**)
IT Polymers, processes
(fabrication of bipolar electrochem. charge storage devices having **polymer electrolytes**)
IT 1310-58-3, Potassium hydroxide, processes 1310-65-2, Lithium hydroxide (LiOH) 1310-73-2, Sodium hydroxide (NaOH), processes 7439-88-5, Iridium, processes 7439-89-6, Iron, processes 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes 7440-18-8, Ruthenium, processes 7440-22-4, Silver, processes 7440-33-7, Tungsten, processes 7440-48-4, Cobalt, processes 7440-58-6, Hafnium, processes 7440-62-2, Vanadium, processes 7440-66-6, Zinc, processes 7647-01-0, **Hydrogen** chloride, processes **7664-38-2**, **Phosphoric acid**, processes **7664-93-9**, **Sulfuric acid**, processes 7697-37-2, Nitric acid, processes 9002-89-5, Polyvinyl alcohol 9002-98-6 9003-01-4, Polyacrylic acid 9003-05-8, Polyacrylamide 9003-06-9, Acrylamide-acrylic acid copolymer 9003-35-4, Phenol-formaldehyde copolymer 9003-39-8, Poly(vinyl pyrrolidone) **9003-47-8**, Poly(vinyl pyridine) 12036-10-1, Ruthenium oxide (RuO2) 24981-14-4, Poly(vinyl fluoride) 25249-16-5, Poly(2-hydroxyethyl methacrylate) 25322-68-3, Polyethylene glycol 28390-30-9 29011-20-9 85885-77-4, Cerium hydroxide (CeOH)
(**fabrication** of bipolar electrochem. charge storage devices contg.)

L62 ANSWER 5 OF 8 HCA COPYRIGHT 2006 ACS on STN
128:199644 **Polymer electrolyte** and electrochemical cell containing this electrolyte. Wu, Han; Li, Changming; Lian, Ke

Keryn (Motorola, Inc., USA). U.S. US 5723231 A **19980303**, 7 pp. (English). CODEN: USXXAM. APPLICATION: US 1996-762477 19961209.

AB The cell comprises 1st and 2nd electrodes fabricated from materials selected from Ru, Ir, Pt, Co, W, V, Fe, etc. and sepd. by an electrolyte material comprising an admixt. of an acid having a b.p. or decompn. temp. >100°, ≥1 polymer, and fumed SiO2 0.2-8 wt.%. An electrochem. capacitor comprises 2 RuO2 electrodes sepd. by a gel electrolyte including an admixt. of **H3PO4** and poly(benzimidazole) in a ratio of (2-50):1, and fumed SiO2 0.5-5 wt.%.

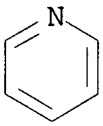
IT **9003-47-8**, Poly(vinylpyridine)
(in electrolyte for electrochem. cell)

RN 9003-47-8 HCA

CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1337-81-1
CMF C7 H7 N
CCI IDS

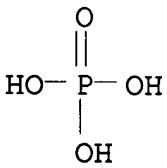


D1— CH═ CH_2

IT **7664-38-2**, **Phosphoric acid**, uses
(in **polymer electrolyte** for electrochem. cell)

RN 7664-38-2 HCA

CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



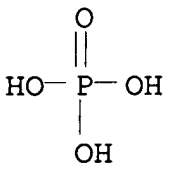
IC ICM H01M006-04

INCL 429203000

CC 76-10 (Electric Phenomena)

Section cross-reference(s): 38, 52
ST electrochem cell **polymer electrolyte**; capacitor electrochem **phosphoric acid** polybenzimidazole electrolyte; silica fumed electrochem cell **polymer electrolyte**
IT Capacitors
Electrolytic cells
(**polymer electrolyte** and electrochem. cell contg. this electrolyte)
IT 12036-10-1, Ruthenium dioxide
(electrodes in capacitor with **polymer electrolyte**)
IT 7631-86-9, Silica, uses
(fumed in **polymer electrolyte** for electrochem. cell)
IT 9002-98-6 9003-01-4, Poly(acrylic acid) 9003-05-8, Polyacrylamide 9003-39-8, Poly(vinylpyrrolidone) **9003-47-8**, Poly(vinylpyridine) 25322-68-3, PEO
(in electrolyte for electrochem. cell)
IT **7664-38-2**, **Phosphoric acid**, uses
(in **polymer electrolyte** for electrochem. cell)

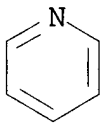
L62 ANSWER 6 OF 8 HCA COPYRIGHT 2006 ACS on STN
111:126071 Gas detection apparatus and method with an electrolyte membrane. Polak, Anthony J.; Petty-Weeks, Sandra (Allied-Signal, Inc., USA). U.S. US 4824528 A **19890425**, 13 pp. Cont. of U.S. Ser. No. 756,614, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1987-70650 19870706. PRIORITY: US 1984-687348 19841228; US 1985-756614 19850719.
AB An app. and method are described for detecting and measuring H and gaseous compds. capable of dissocg. into or combining with H ions using a **solid-electrolyte** concn. cell. A **solid-electrolyte** membrane is used which comprises an org. polymer-inorg. compd. blend prepd. by admixing an org. polymer, such as poly(vinyl alc.) with **phosphoric acid** in a mutually miscible solvent. A ref. gas or a solid ref. substance is used. For increased, strength, a membrane may be composited with or attached to a porous support.
IT **7664-38-2**, **Orthophosphoric acid**, uses and miscellaneous **9003-47-8**, Polyvinyl pyridine
(electrolyte-membrane gas detection app. contg.)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)

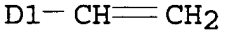


RN 9003-47-8 HCA
CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 1337-81-1
CMF C7 H7 N
CCI IDS





IC ICM G01N027-58
INCL 204-1T
CC 79-2 (Inorganic Analytical Chemistry)
IT 2466-09-3, Pyrophosphoric acid 7440-05-3, Palladium, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous **7664-38-2**, **Orthophosphoric acid**, uses and miscellaneous 7803-60-3, Hypophosphoric acid 9002-89-5, Polyvinyl alcohol 9002-98-6 9003-01-4, Polyacrylic acid 9003-05-8, Polyacrylamide 9003-39-8, Polyvinyl pyrrolidinone **9003-47-8**, Polyvinyl pyridine 9004-35-7, Cellulose acetate 10343-62-1, Metaphosphoric acid 12648-42-9, Palladium hydride 24981-14-4, Polyvinyl fluoride 25189-55-3, Poly(N-isopropyl acrylamide) 25322-68-3, Polyethylene glycol 25805-17-8 26101-52-0, Poly(vinyl sulfonic acid) 26793-34-0
(electrolyte-membrane gas detection app. contg.)

L62 ANSWER 7 OF 8 HCA COPYRIGHT 2006 ACS on STN
111:42849 Hydrogen separation and electricity generation using novel electrolyte membranes. Polak, Anthony J.; Petty-Weeks, Sandra (Allied-Signal, Inc., USA). U.S. US 4797185 A **19890110**, 12 pp. Cont. of U. S. Ser. No. 756,889, abandoned. (English).

CODEN: USXXAM. APPLICATION: US 1987-70620 19870706. PRIORITY: US 1984-687351 19841228; US 1985-756889 19850719.

AB An app. for performing an electrochem. process involving a gaseous mixt. having a component which, in the presence of a catalytic agent, is capable of dissocg. to yield H ions or of combining with H ions, comprises a thin-film macroscopically homogeneous polymer blend membrane, a membrane housing comprising a 1st and a 2nd gas chamber sepd. by the membrane, 2 sep. portions of catalytic agent effective to promote the dissocn. and combination, and means for forming an elec. connection in operative contact with the catalytic agent. The app. comprises also means to supply fuel gas to 1 and oxidant gas to the other of the 2 chambers, or to supply the gaseous mixt. to 1 and remove H from the other chamber. The membrane possessing a high protonic cond. and formed by removing the solvent from a soln. of a **phosphoric acid** and a polymer contains .apprx.10-70% H2PO3, HPO3, **H3PO4**, H4P2O7, and polyphosphoric acid and .apprx.30-90% polymer such as poly(vinyl alc.), poly(vinyl fluoride), polyethylene glycol, etc. In 1 version, the membrane may be formed into a hollow fiber having elec. conductive particles with catalyst embedded in the fiber walls; a multiplicity of such fibers may be used to **form** a **H** sepn. device.

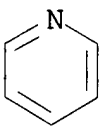
IT **9003-47-8**, Poly(vinyl pyridine)
(membranes from blends contg. phosphorus acids and, for fuel cells and hydrogen sepn.)

RN 9003-47-8 HCA

CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

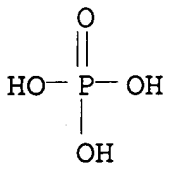
CRN 1337-81-1
CMF C7 H7 N
CCI IDS



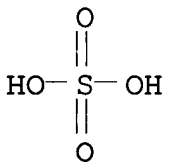
D1— CH== CH_2

IT **7664-38-2**, **Phosphoric acid**, uses and miscellaneous **7664-93-9**, **Sulfuric acid**, uses and miscellaneous
(membranes from blends contg. polymer and, for fuel cells and

hydrogen sepn.)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P, Hydrogen, preparation**
(sepn. of, membranes from phosphorus acid-polymer blends for)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

IC ICM C25B001-02
ICS C25B009-00
INCL 204129000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49, 72
ST hydrogen sepn acid polymer membrane; fuel cell acid polymer membrane; **phosphoric acid** polymer membrane cond; **cond protonic** acid **polymer** membrane
IT 9002-89-5, Poly(vinyl alcohol) 9002-98-6, Polyethylenimine 9003-01-4, Poly(acrylic acid) 9003-05-8, Poly(acrylamide) 9003-43-4, Poly(vinyl pyrrolidine) **9003-47-8**, Poly(vinyl pyridine) 9004-35-7, Cellulose acetate 24981-14-4, Poly(vinyl fluoride) 25189-55-3, Poly(N-isopropyl acrylamide) 25322-68-3, Poly(ethylene glycol) 25805-17-8, Poly(ethyloxazoline) 26101-52-0, Poly(vinyl sulfonic acid) 26793-34-0, Poly(N,N-dimethyl acrylamide) 26913-06-4, Polyethylenimine
(membranes from blends contg. phosphorus acids and, for fuel cells and hydrogen sepn.)
IT 2466-09-3, Pyrophosphoric acid **7664-38-2**,

Phosphoric acid, uses and miscellaneous
7664-93-9, **Sulfuric acid**, uses and miscellaneous 7803-60-3, Hypophosphoric acid 10343-62-1, Metaphosphoric acid
(membranes from blends contg. polymer and, for fuel cells and hydrogen sepn.)

IT **1333-74-0P**, **Hydrogen**, **preparation**
(sepn. of, membranes from phosphorus acid-polymer blends for)

L62 ANSWER 8 OF 8 HCA COPYRIGHT 2006 ACS on STN

107:69923 Gas detection with a three-component membrane and a sensor using this membrane. Petty-Weeks, Sandra (UOP Inc., USA). U.S. US 4661211 A **19870428**, 13 pp. (English). CODEN: USXXAM. APPLICATION: US 1985-753477 19850710.

AB The title app. and method are described for detecting and measuring H and gaseous compds. capable of dissocg. into or combining with H ions using a **solid electrolyte** concn. cell. A novel **solid electrolyte** membrane is used which comprises a 3-component blend prepd. by admixing an org. polymer or copolymer, such as poly(vinyl alc.), with an inorg. compd., such as **H3PO4**, and an org. compd. selected from a group of polymers and copolymers having monomer units contg. N, O, or S atoms, such as poly(vinyl pyrrolidinone), in a mutually miscible solvent. A ref. gas or a solid ref. substance is used. For increased strength, a membrane may be composited with or attached to a porous support without losing its desirable properties.

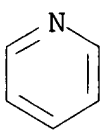
IT **9003-47-8**, Poly(vinylpyridine) **7664-38-2D**, derivs.
7664-93-9, **Sulfuric acid**, uses and miscellaneous
(in hydrogen gas sensor with three-component membrane)

RN 9003-47-8 HCA

CN Pyridine, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

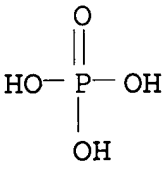
CM 1

CRN 1337-81-1
CMF C7 H7 N
CCI IDS

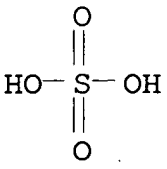


D1— CH═ CH_2

RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IC ICM G01N027-58
INCL 204-1T
CC 79-2 (Inorganic Analytical Chemistry)
Section cross-reference(s): 38, 67, 76
IT 9002-89-5, Polyvinyl alcohol 9002-98-6 9003-05-8, Poly(acrylamide) 9003-35-4 9003-39-8, Poly(vinyl pyrrolidinone) 9003-43-4, Poly(vinyl pyrrolidine) **9003-47-8**, Poly(vinylpyridine) 9004-35-7D, Cellulose acetate, polymers 12648-42-9, Palladium hydride 24981-14-4, Polyvinyl fluoride 25322-68-3 25585-49-3 25805-17-8 26101-52-0, Poly(vinyl sulfonic acid) 7440-05-3, Palladium, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous **7664-38-2D**, derivs. **7664-93-9**, **Sulfuric acid**, uses and miscellaneous
(in hydrogen gas sensor with three-component membrane)

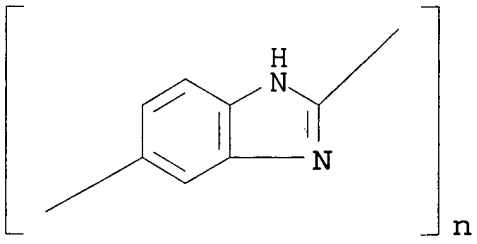
=>

=> D L63 1-5 CBIB ABS HITSTR HITIND

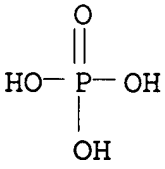
L63 ANSWER 1 OF 5 HCA COPYRIGHT 2006 ACS on STN
140:96885 **Proton conductive solid polymer electrolyte** for electrochemical cell.
Komiya, Teruaki (Honda Giken Kabushiki Kaisha, Japan). Eur. Pat. Appl. EP 1381107 A2 20040114, 14 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK. (English). CODEN: EPXXDW. APPLICATION: EP 2003-254383 20030710. PRIORITY: JP 2002-201718 20020710.

AB A material such as imidazole (nitrogen-contg. heterocyclic compd.), which has at least one lone pair, is dispersed in a basic solid polymer such as polybenzimidazole. The mole no. of imidazole per g of polybenzimidazole is less than 0.0014 mol, preferably less than 0.0006 mol. The basic solid polymer is impregnated with an acidic inorg. liq. such as **phosphoric acid** and **sulfuric acid** to prep. a **proton conductive solid polymer electrolyte.**

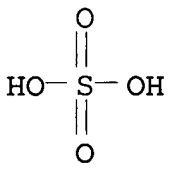
IT **32109-42-5**, Poly(1H-benzimidazole-2,5-diyl)
(**proton conductive solid polymer electrolyte** for electrochem. cell)
RN 32109-42-5 HCA
CN Poly(1H-benzimidazole-2,5-diyl) (9CI) (CA INDEX NAME)



IT **7664-38-2**, **Phosphoric acid**, uses
7664-93-9, **Sulfuric acid**, uses
(**proton conductive solid polymer electrolyte** for electrochem. cell)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M006-18; C08G073-18
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72
ST electrochem cell **proton conductive solid polymer electrolyte**; fuel cell **proton conductive solid polymer electrolyte**; **electrolyzer proton conductive solid polymer electrolyte**
IT Azines
(diazine; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT Heterocyclic compounds
(nitrogen; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT Electrochemical cells
Electrolytic cells
Fuel cell **electrolytes**
Solid electrolytes
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT Polybenzimidazoles
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT Ionic **conductivity**
(**proton; proton conductive solid polymer electrolyte** for electrochem. cell)
IT Fuel cells
(**solid electrolyte; proton conductive solid polymer electrolyte** for electrochem. cell)
IT 7732-18-5, Water, processes
(**electrolysis; proton conductive solid polymer electrolyte** for electrochem. cell)

IT 91-22-5, Quinoline, uses 110-86-1, Pyridine, uses 119-65-3, IsoQuinoline 120-72-9, Indole, uses 120-73-0, Purine 288-13-1, Pyrazole 288-32-4, Imidazole, uses 9002-98-6 9003-47-8, Polyvinylpyridine 25232-42-2, Polyvinylimidazole 25233-30-1 25823-41-0, Poly(1-vinylpyrazole) **32109-42-5**, Poly(1H-benzimidazole-2,5-diyl) 50641-39-9 131714-35-7
(**proton conductive solid polymer electrolyte** for electrochem. cell)

IT **7664-38-2**, **Phosphoric acid**, uses
7664-93-9, **Sulfuric acid**, uses
(**proton conductive solid polymer electrolyte** for electrochem. cell)

IT 1333-74-0P, **Hydrogen**, preparation 7782-44-7P, Oxygen, preparation
(**proton conductive solid polymer electrolyte** for electrochem. cell)

L63 ANSWER 2 OF 5 HCA COPYRIGHT 2006 ACS on STN

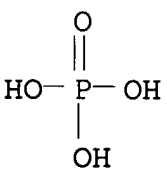
138:224099 Properties of ab-PBI membranes for fuel cells. Uchida, Hiroyuki; Yamada, Yoshifumi; Asano, Naoki; Watanabe, Masahiro; Litt, Morton (Graduate School of Engineering, University of Yamanashi, Takeda 4, Kofu, 400-8511, Japan). Electrochemistry (Tokyo, Japan), 70(12), 943-945 (English) **2002.** CODEN: EECTFA. ISSN: 1344-3542. Publisher: Electrochemical Society of Japan.

AB Poly(2,5-benzimidazole) (ab-PBI) membranes were characterized for use as electrolytes in fuel cells operating at elevated temps. (100 to 200°). The cond. of **phosphoric acid** -doped ab-PBI was ≤0.12 S cm-1 at temps. <120°, but it decreased to 0.025 S cm-1 >150° due to a dehydration of the doped acid. Using the **H3PO4**-doped ab-PBI, H2/O2 fuel cell could be operated at 120° with a low humidification of reactant gases, although it was necessary to keep the acid-doping level high in both the membrane and the electrodes.

IT **7664-38-2**, **Phosphoric acid**, uses
(complexes with Poly(2,5-benzimidazole)(electrolyte) or platinum/carbon/PTFE (electrodes); properties of acid-doped ab-PBI electrolyte membranes for fuel cells)

RN 7664-38-2 HCA

CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)

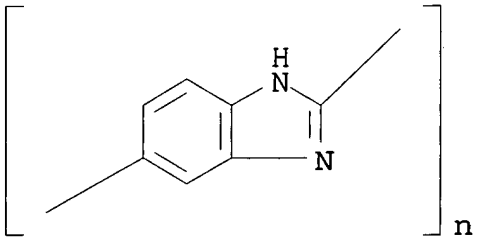


IT **32109-42-5**, Poly(2,5-benzimidazole)

(**phosphoric acid**-doped; properties of acid-doped ab-PBI electrolyte membranes for fuel cells)

RN 32109-42-5 HCA

CN Poly(1H-benzimidazole-2,5-diyl) (9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST membrane polybenzimidazole **phosphoric acid** doped **polymer electrolyte** fuel cell; PBI membrane electrolyte humidity effect cond

IT Electric conductivity
Fuel cell electrolytes
Polymer electrolytes
(properties of acid-doped ab-PBI electrolyte membranes for fuel cells)

IT **7664-38-2**, **Phosphoric acid**, uses
(complexes with Poly(2,5-benzimidazole)(electrolyte) or platinum/carbon/PTFE (electrodes); properties of acid-doped ab-PBI electrolyte membranes for fuel cells)

IT **32109-42-5**, Poly(2,5-benzimidazole)
(**phosphoric acid**-doped; properties of acid-doped ab-PBI electrolyte membranes for fuel cells)

L63 ANSWER 3 OF 5 HCA COPYRIGHT 2006 ACS on STN

138:73636 **Proton-conducting polymers** based on benzimidazoles and sulfonated benzimidazoles. Asensio, Juan Antonio; Borros, Salvador; Gomez-Romero, Pedro (Institut de Ciencia de Materials de Barcelona (CSIC), Barcelona, E-08193, Spain). Journal of Polymer Science, Part A: Polymer Chemistry, 40(21), 3703-3710 (English) **2002**. CODEN: JPACEC. ISSN: 0887-624X. Publisher: John Wiley & Sons, Inc..

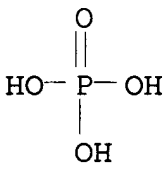
AB A sulfonated deriv. of polybenzimidazole is reported, and its properties are analyzed in comparison with related polybenzimidazole proton-conducting materials. Poly(2,5-benzimidazole), poly(m-phenylenebenzobisimidazole), and poly[m-(5-sulfo)-phenylenebenzobisimidazole] were prepd. by condensation of the corresponding monomers in polyphosphoric acid. Several adducts of these polymers with **phosphoric acid** were prepd. The resulting materials were characterized by chem. anal., Fourier

transform IR spectroscopy, and thermogravimetric anal.; also, the dc cond. of doped and undoped derivs. was measured. Similar to what has been obsd. for the com. polybenzimidazole polymer (also examd. here for comparison), the title polymers exhibit high thermal stability. Furthermore, their doping with **phosphoric acid** leads to a significant increase in cond. from less than 10-11 Scm-1 for the undoped polymers to 10-4 Scm-1 (both at room temp.) for their acid-loaded derivs.

IT **7664-38-2**, **Phosphoric acid**, uses
(dopant; **proton-conducting polymers** based on benzimidazoles and sulfonated benzimidazoles)

RN 7664-38-2 HCA

CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



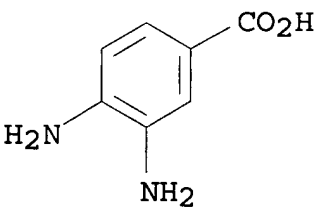
IT **29692-96-4P**, 3,4-Diaminobenzoic **acid** homopolymer
32109-42-5P, Poly(1H-benzimidazole-2,5-diyl)
(**phosphoric acid**-doped; **proton-conducting polymers** based on benzimidazoles and sulfonated benzimidazoles)

RN 29692-96-4 HCA

CN Benzoic acid, 3,4-diamino-, homopolymer (9CI) (CA INDEX NAME)

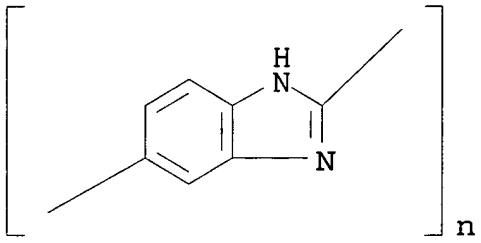
CM 1

CRN 619-05-6
CMF C7 H8 N2 O2



RN 32109-42-5 HCA

CN Poly(1H-benzimidazole-2,5-diyl) (9CI) (CA INDEX NAME)



CC 35-5 (Chemistry of Synthetic High Polymers)
ST sulfonated polybenzimidazole synthesis thermal property; elec cond **phosphoric acid** doping polybenzimidazole
IT Polybenzimidazoles
(**phosphoric acid**-doped; **proton-conducting polymers** based on benzimidazoles and sulfonated benzimidazoles)
IT Polybenzimidazoles
(polybenzodiimidazoles, or sulfonated, **phosphoric acid**-doped; **proton-conducting polymers** based on benzimidazoles and sulfonated benzimidazoles)
IT **Conducting polymers**
Electric **conductivity**
Polymer chains
Thermal stability
(**proton-conducting polymers** based on benzimidazoles and sulfonated benzimidazoles)
IT **7664-38-2, Phosphoric acid**, uses
(dopant; **proton-conducting polymers** based on benzimidazoles and sulfonated benzimidazoles)
IT 27233-57-4P **29692-96-4P**, 3,4-Diaminobenzoic **acid** homopolymer **32109-42-5P**, Poly(1H-benzimidazole-2,5-diyl) 96937-27-8P 481710-69-4P 481710-70-7P
(**phosphoric acid**-doped; **proton-conducting polymers** based on benzimidazoles and sulfonated benzimidazoles)

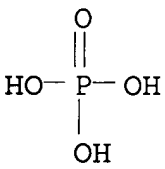
L63 ANSWER 4 OF 5 HCA COPYRIGHT 2006 ACS on STN
132:79110 Polybenzimidazoles/**phosphoric acid** **solid polymer electrolytes**: mechanical and electrical properties. Litt, M.; Ameri, R.; Wang, Y.; Savinell, R.; Wainwright, J. (Macromolecular Science Dept., Case Western Reserve University, Cleveland, OH, 44106-7202, USA). Materials Research Society Symposium Proceedings, 548(Solid State Ionics V), 313-323 (English) **1999**. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.
AB Poly(2,2'-(m-phenylene)-5,5'-bibenzimidazole), PBI and poly

(2,5-benzimidazole), ABPBI, were cast into films and doped with **phosphoric acid.** Their mech. properties were studied as a function of inherent viscosity and **phosphoric acid** content. The com. PBI with an I. V. of 0.8 to 0.9 had relatively low elongation at break. It was fractionated; the higher the inherent viscosity the higher the modulus and elongation. At low **phosphoric acid** doping the modulus rose because a cryst. phase developed, and then dropped as more **phosphoric acid** was added. A second doping method produced films with high crystallinity and higher cond. (0.02-.03 vs. 0.06-.08 S/cm.) but poorer elongation than those made by doping a cast film in **phosphoric acid.** In order to get higher mol. wt. films that could have better mech. properties, we decided to polymerize 3,4-diaminobenzoic acid to ABPBI, an AB polymer for which I. V.'s of .apprx. 16 have been reported. After learning how to purify and polymerize the monomer, I.V.'s of 6-8 were easily obtained. Conductivities of the doped ABPBI films were as high as those of the best PBI films. With their high viscosities, the ABPBI films were much tougher and had better elongation than the doped PBI films.

IT **7664-38-2, Phosphoric acid**, properties
(mech. and elec. properties of polybenzimidazole/ **phosphoric acid solid polymer electrolytes**)

RN 7664-38-2 HCA

CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



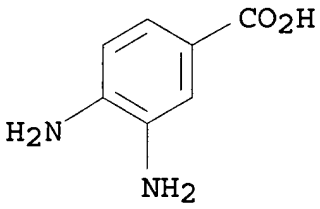
IT **29692-96-4**, 3,4-Diaminobenzoic acid homopolymer
32109-42-5, Poly(1H-benzimidazole-2,5-diyl)
(mech. and elec. properties of polybenzimidazole/ **phosphoric acid solid polymer electrolytes**)

RN 29692-96-4 HCA

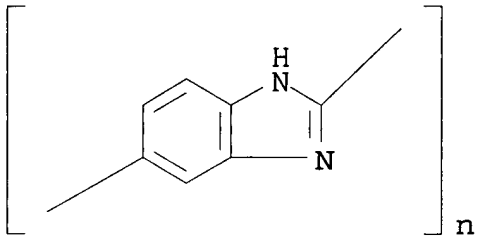
CN Benzoic acid, 3,4-diamino-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 619-05-6
CMF C7 H8 N2 O2



RN 32109-42-5 HCA
CN Poly(1H-benzimidazole-2,5-diyl) (9CI) (CA INDEX NAME)



CC 36-5 (Physical Properties of Synthetic High Polymers)
ST polybenzimidazole **phosphoric acid** doped **solid electrolyte**; elec mech property polybenzimidazole **phosphoric acid** electrolyte
IT Expansion
(elongation at break; mech. and elec. properties of polybenzimidazole/**phosphoric acid solid polymer electrolytes**)
IT Crystallinity
Doping
Electric conductivity
Polymer electrolytes
Tensile strength
Young's modulus
(mech. and elec. properties of polybenzimidazole/**phosphoric acid solid polymer electrolytes**)
IT Polybenzimidazoles
(mech. and elec. properties of polybenzimidazole/**phosphoric acid solid polymer electrolytes**)
IT Stress, mechanical
(yield; mech. and elec. properties of polybenzimidazole/**phosphoric acid solid polymer electrolytes**)
IT **7664-38-2, Phosphoric acid**, properties
(mech. and elec. properties of polybenzimidazole/

phosphoric acid solid polymer electrolytes)

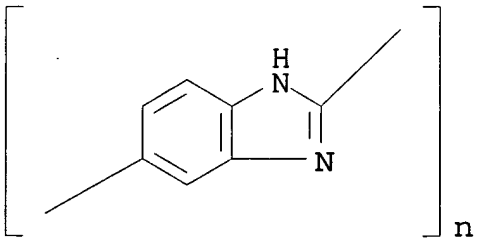
IT 25734-65-0, Poly(2,2'-(m-phenylene)-5,5'-bibenzimidazole)
26101-19-9, Isophthalic acid-3,3',4,4'-Tetraminobiphenyl copolymer
29692-96-4, 3,4-Diaminobenzoic acid homopolymer
32109-42-5, Poly(1H-benzimidazole-2,5-diyl)
(mech. and elec. properties of polybenzimidazole/ **phosphoric acid solid polymer electrolytes**)

L63 ANSWER 5 OF 5 HCA COPYRIGHT 2006 ACS on STN
132:38168 **Solid polymer electrolytes.**
Akita, Hiroshhi; Ichikawa, Masao; Iguchi, Masaru; Nosaki, Katsutoshi; Oyanagi, Hiroyuki (Honda Giken Kogyo K. K., Japan). Eur. Pat. Appl. EP 967674 A1 **19991229**, 19 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1999-303888 19990519. PRIORITY: JP 1998-153644 19980520.

AB In a **solid polymer electrolyte**, an imidazole ring-contg. polymer is doped with an acid in which ≥1 H atom of an inorg. acid is substituted by a functional group having a Ph group. The imidazole ring-contg. polymer is a polybenzimidazole compd. The inorg. **acid** is **phosphoric acid.** The amt. of the acid with which the imidazole ring-contg. polymer is doped is from 1 to 10 mols./repeating structure unit of a mol. chain of the polymer. The **polymer electrolyte** is produced by a soln. blend method.

IT **32109-42-5**, Poly(1H-benzimidazole-2,5-diyl)
(**solid polymer electrolytes** with imidazole ring-contg. polymer)

RN 32109-42-5 HCA
CN Poly(1H-benzimidazole-2,5-diyl) (9CI) (CA INDEX NAME)



IC ICM H01M006-18
ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST battery **solid polymer electrolyte;**
imidazole ring contg **polymer electrolyte** battery

IT Battery **electrolytes**
(**solid polymer electrolytes** with
imidazole ring-contg. polymer)

IT 838-85-7, Diphenylphosphate 993-13-5, Methylphosphonic acid
1571-33-1, Phenylphosphonic acid 1809-19-4, Phosphonic acid,
dibutyl ester 3658-48-8, Phosphonic acid, bis(2-ethylhexyl) ester
(dopant; **solid polymer electrolytes**
with imidazole ring-contg. polymer)

IT 25734-65-0 **32109-42-5**, Poly(1H-benzimidazole-2,5-diyl)
(**solid polymer electrolytes** with
imidazole ring-contg. polymer)

IT 76-05-1, Trifluoroacetic acid, uses
(**solid polymer electrolytes** with
imidazole ring-contg. polymer)

=>

=> D L65 1-6 CBIB ABS HITSTR HITIND

L65 ANSWER 1 OF 6 HCA COPYRIGHT 2006 ACS on STN
140:96885 **Proton conductive solid polymer electrolyte** for electrochemical cell.
Komiya, Teruaki (Honda Giken Kabushiki Kaisha, Japan). Eur. Pat. Appl. EP 1381107 A2 20040114, 14 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK. (English). CODEN: EPXXDW. APPLICATION: EP 2003-254383 20030710. PRIORITY: JP 2002-201718 20020710.

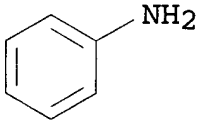
AB A material such as imidazole (nitrogen-contg. heterocyclic compd.), which has at least one lone pair, is dispersed in a basic solid polymer such as polybenzimidazole. The mole no. of imidazole per g of polybenzimidazole is less than 0.0014 mol, preferably less than 0.0006 mol. The basic solid polymer is impregnated with an acidic inorg. liq. such as **phosphoric acid** and **sulfuric acid** to prep. a **proton conductive solid polymer electrolyte.**

IT **25233-30-1 50641-39-9 131714-35-7**
(**proton conductive solid polymer electrolyte** for electrochem. cell)

RN 25233-30-1 HCA
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

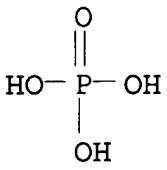
CM 1

CRN 62-53-3
CMF C6 H7 N

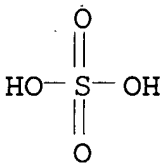


RN 50641-39-9 HCA
CN Poly([5,5'-bi-1H-benzimidazole]-2,2'-diylphenylene) (9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 131714-35-7 HCA
CN Poly[(1,5-dihydrobenzo[1,2-d:4,5-d']diimidazole-2,6-diyl)phenylene] (9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **7664-38-2, Phosphoric acid**, uses
7664-93-9, Sulfuric acid, uses
(**proton conductive solid**

polymer electrolyte for electrochem. cell)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7664-93-9 HCA
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P, Hydrogen, preparation**
7782-44-7P, Oxygen, preparation
(proton conductive solid
polymer electrolyte for electrochem. cell)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

IC ICM H01M010-40
ICS H01M006-18; C08G073-18
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72
ST electrochem cell **proton conductive solid polymer electrolyte**; fuel cell **proton conductive solid polymer electrolyte**; **electrolyzer proton conductive solid polymer electrolyte**
IT Azines

(diazine; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT Heterocyclic compounds
(nitrogen; **proton conductive solid polymer electrolyte** for electrochem. cell)
IT Electrochemical cells
Electrolytic cells
Fuel cell **electrolytes**
Solid electrolytes
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT Polybenzimidazoles
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT Ionic **conductivity**
(**proton; proton conductive solid polymer electrolyte** for electrochem. cell)
IT Fuel cells
(**solid electrolyte; proton conductive solid polymer electrolyte** for electrochem. cell)
IT 7732-18-5, Water, processes
(**electrolysis; proton conductive solid polymer electrolyte** for electrochem. cell)
IT 91-22-5, Quinoline, uses 110-86-1, Pyridine, uses 119-65-3, IsoQuinoline 120-72-9, Indole, uses 120-73-0, Purine 288-13-1, Pyrazole 288-32-4, Imidazole, uses 9002-98-6 9003-47-8, Polyvinylpyridine 25232-42-2, Polyvinylimidazole **25233-30-1** 25823-41-0, Poly(1-vinylpyrazole) 32109-42-5, Poly(1H-benzimidazole-2,5-diyl) **50641-39-9** **131714-35-7**
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT **7664-38-2, Phosphoric acid**, uses **7664-93-9, Sulfuric acid**, uses
(**proton conductive solid polymer electrolyte** for electrochem. cell)
IT **1333-74-0P, Hydrogen, preparation** **7782-44-7P, Oxygen, preparation**
(**proton conductive solid polymer electrolyte** for electrochem. cell)

L65 ANSWER 2 OF 6 HCA COPYRIGHT 2006 ACS on STN
133:137861 **Proton conducting** membrane using a **solid** acid for fuel cells. Haile, Sossina M.; Boysen, Dane; Narayanan, Sekharipuram R.; Chisholm, Calum (California Institute of

Technology, USA). PCT Int. Appl. WO 2000045447 A2 **20000803** , 61 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US1783 20000121. PRIORITY: US 1999-PV116741 19990122; US 1999-PV146946 19990802; US 1999-PV146943 19990802; US 1999-PV151811 19990830; US 1999-439377 19991115.

AB A solid acid material is used as a proton conducting membrane in an electrochem. device. The solid acid material can be one of a plurality of different kinds of materials. A binder can be added, and that binder can be either a nonconducting or a conducting binder. Nonconducting binders can be, for example, a polymer or a glass. A conducting binder enables the device to be both proton conducting and electron conducting.

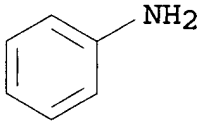
IT **25233-30-1**, Polyaniline
(**proton conducting** membrane using **solid** acid for fuel cells)

RN 25233-30-1 HCA

CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



IT **1333-74-0P, Hydrogen, preparation**
(separator; **proton conducting** membrane using **solid** acid for fuel cells)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

ICI H01

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72, 76

ST fuel cell **proton conducting** membrane **solid** acid

IT **Conducting polymers**
Electric **conductors**
Electric insulators
Semiconductor materials
(binder; **proton conducting** membrane using **solid** acid for fuel cells)

IT Fluoropolymers, uses
Glass, uses
Metals, uses
Polyesters, uses
Polymers, uses
(binder; **proton conducting** membrane using **solid** acid for fuel cells)

IT Sintering
(hot pressing; **proton conducting** membrane using **solid** acid for fuel cells)

IT Polyketones
Polyketones
(polyether-; **proton conducting** membrane using **solid** acid for fuel cells)

IT Polyethers, uses
Polyethers, uses
(polyketone-; **proton conducting** membrane using **solid** acid for fuel cells)

IT Battery electrolytes
Ceramics
Electrolytic cells
Fuel cell electrolytes
Fuel cells
(**proton conducting** membrane using **solid** acid for fuel cells)

IT Fluoropolymers, uses
Phosphates, uses
Polyanilines
Polysiloxanes, uses
Selenates
Silicates, uses
Sulfates, uses
(**proton conducting** membrane using **solid** acid for fuel cells)

IT Capacitors
(supercapacitor; **proton conducting** membrane using **solid** acid for fuel cells)

IT 7440-21-3, Silicon, uses 24937-79-9, Pvdf
(binder; **proton conducting** membrane using **solid** acid for fuel cells)

IT 7782-42-5, Graphite, uses
(paper; **proton conducting** membrane using **solid** acid for fuel cells)

IT 7722-76-1, Ammonium dihydrogen phosphate 7789-16-4, Cesium **hydrogen** sulfate cshso4 7803-63-6, Ammonium **hydrogen** sulfate 10294-60-7, Ammonium **hydrogen** selenate 12593-60-1, Ammonium phosphate sulfate ((NH4)2(H2PO4)(HSO4)) 13453-45-7, Thallium **hydrogen** sulfate tlhso4 13774-16-8, Rubidium dihydrogen phosphate 13775-30-9 13778-50-2, Sodium silicate Na3HSiO4 13780-02-4 15457-97-3, Sodium silicate (Na2H2SiO4) 15587-72-1, Rubidium **hydrogen** sulfate 16331-85-4 18649-05-3, Cesium dihydrogen phosphate 20583-58-8, **Sulfuric acid**, rubidium salt (2:3) 22112-04-5 39473-99-9, Rubidium phosphate selenate (Rb2(H2PO4)(HSeO4)) 41469-37-8, Sodium silicate NaH3SiO4 63317-98-6 63737-07-5, Cesium **hydrogen** selenate cshseo4 68875-27-4, Rubidium **hydrogen** selenate 71555-62-9 88937-51-3 89190-25-0 99489-71-1, Ammonium arsenate sulfate ((NH4)2(H2AsO4)(HSO4)) 99543-07-4, Selenic acid, cesium salt (2:3) 101811-97-6, Potassium silicate KH3SiO4 135498-03-2 135710-63-3 157612-88-9 161430-99-5, Tellurium oxide teo4 161882-09-3 165901-90-6, Cesium phosphate sulfate (Cs3(H2PO4)(HSO4)2) 183953-14-2, Silicic acid (H4SiO4), tripotassium salt 183953-17-5, Silicic acid (H4SiO4), dipotassium salt 213411-40-6, Cesium phosphate sulfate (Cs3(H2PO4)0.5(HSO4)2.5) 218931-29-4, Cesium phosphate sulfate (Cs5(H2PO4)2(HSO4)3) 220078-67-1, Cesium phosphate selenate (Cs3(H2PO4)(HSeO4)2) 220078-71-7, Cesium phosphate selenate (Cs5(H2PO4)2(HSeO4)3) 231277-45-5, Cesium phosphate sulfate (Cs2(H2PO4)(HSO4)) 233277-01-5, Ammonium phosphate selenate ((NH4)2(H2PO4)(HSeO4)) 260429-55-8, Rubidium phosphate sulfate (Rb2(H2PO4)(HSO4)) 286382-74-9, Cesium phosphate selenate (Cs2(H2PO4)(HSeO4)) 286382-75-0 286382-77-2 286382-78-3 286382-79-4, Cesium phosphate selenate (Cs3(H2PO4)0.5(HSeO4)2.5) 286382-81-8 286382-82-9 286382-83-0 286382-84-1 286382-85-2 286382-86-3 286382-87-4 286382-88-5 286382-89-6 286382-90-9
(**proton conducting** membrane using **solid** acid for fuel cells)

IT 1302-88-1, Cordierite 1309-48-4, Magnesia, uses 1344-28-1, Alumina, uses 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-22-4, Silver, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-66-6, Zinc, uses 7631-86-9, Silica, uses 9002-84-0, Ptfe 25038-78-2, Poly(dicyclopentadiene) **25233-30-1**, Polyaniline 25667-42-9 30604-81-0, Polypyrrole 31900-57-9, Polydimethyl siloxane
(**proton conducting** membrane using **solid** acid for fuel cells)

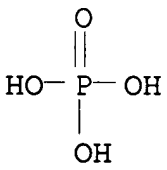
IT **1333-74-0P, Hydrogen, preparation**
(separator; **proton conducting** membrane using **solid** acid for fuel cells)

L65 ANSWER 3 OF 6 HCA COPYRIGHT 2006 ACS on STN
131:164272 Electrolytic capacitor and its manufacture. Saito, Kazuyo; Nitta, Yukihiro; Tada, Hiroshi; Iwamoto, Shigeyoshi (Matsushita Electric Industrial Co., Ltd., Japan). Eur. Pat. Appl. EP 938108 A2 **19990825**, 17 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1999-100927 19990120. PRIORITY: JP 1998-15269 19980128; JP 1998-350072 19981209.

AB An electrolytic capacitor includes (a) a capacitor element having a pos. electrode, a neg. electrode, and a solid org. conductive material disposed between the pos. electrode and the neg. electrode; (b) an electrolyte; (c) a case for accommodating the capacitor element and the electrolyte; and (d) a sealing member disposed to cover the opening of the case. The solid org. conductive material contains an org. semiconductor and/or a conductive polymer. An electrolytic capacitor having excellent impedance characteristic, small leakage current, excellent reliability, and high dielec. strength is obtained.

IT **7664-38-2, Phosphoric acid**, processes
25233-30-1, Polyaniline **25233-30-1D**, Polyaniline, sulfonated
(**manuf.** of electrolytic capacitors contg.)

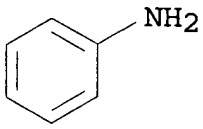
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 25233-30-1 HCA
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

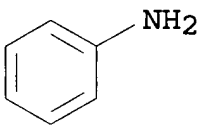
CRN 62-53-3
CMF C6 H7 N



RN 25233-30-1 HCA
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



IC ICM H01G009-02
CC 76-10 (Electric Phenomena)
Section cross-reference(s): 38
IT Conducting **polymers**
Manila hemp (Musa textilis)
Paper
Seals (parts)
(manuf. of **electrolytic** capacitors contg.)
IT 56-81-5, 1,2,3-Propanetriol, processes 62-23-7, p-Nitrobenzoic acid 69-65-8, Mannite 88-75-5 96-48-0 107-21-1, 1,2-Ethanediol, processes 552-16-9, **o**-Nitrobenzoic acid 1518-16-7D, TCNQ, complexes 1623-15-0, Monobutyl phosphate 3385-41-9, Diammonium adipate 7429-90-5, Aluminum, processes 7440-44-0, Carbon, processes **7664-38-2**, **Phosphoric acid**, processes 7727-54-0, Ammonium persulfate 7803-65-8 10028-22-5, Ferric sulfate 10043-35-3, Boric acid, processes 13445-49-3, Peroxydisulfuric acid ([(HO)S(O)2]2O2) **25233-30-1**, Polyaniline **25233-30-1D**, Polyaniline, sulfonated 25233-34-5, Polythiophene 25233-34-5D, Polythiophene, sulfonated 30604-81-0, Polypyrrole 30604-81-0D, Polypyrrole, sulfonated 50905-10-7, 1,6-Decanedicarboxylic acid 77214-82-5 88107-08-8 92538-40-4 117920-72-6 126213-51-2 127171-87-3, Tetramethyl ammonium phthalate, processes 167552-54-7, processes
(**manuf.** of electrolytic capacitors contg.)

L65 ANSWER 4 OF 6 HCA COPYRIGHT 2006 ACS on STN
122:276448 Transport of protons and water through polyaniline membranes

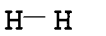
studied with online mass spectrometry. Schmidt, V. M.; Tegtmeyer, D.; Heitbaum, J. (Institut fuer Physikalische Chemie, Universitaet Witten/Herdecke, Stockumer Strasse 10, Witten-Annen, 58453, Germany). Journal of Electroanalytical Chemistry, 385(2), 149-55 (English) **1995.** CODEN: JECHES. ISSN: 0368-1874. Publisher: Elsevier.

AB The hydrogen evolution reaction (HER) was followed during the polymn. of aniline on porous platinum electrodes by cyclic voltammetry combined with online mass spectrometry. The reaction takes place at the electrode|polymer interface by considering the collection efficiency of the membrane inlet system. Homogeneous films of polyaniline (PANI) can be deposited onto porous electrode substrates. In this way, a pervaporation membrane is formed with the conducting polymer as the active layer. The permeation of water through a PANI membrane is dependent on the oxidn. state of PANI. The higher permeability in the oxidized state is explained in terms of structural alterations during the redox process.

IT **1333-74-0P**, Hydrogen, properties
(electrochem. evolution during aniline polymn. on porous platinum studied by cyclic voltammetry and mass spectrometry)

RN 1333-74-0 HCA

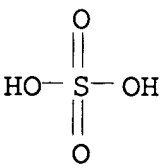
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)



IT **7664-93-9**, **Sulfuric acid**, uses
(redox of polyaniline in **sulfuric acid** accompanied by potential-dependent permeation of water)

RN 7664-93-9 HCA

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **25233-30-1P**, Polyaniline
(transport of protons and water through polyaniline membranes studied with online mass spectrometry)

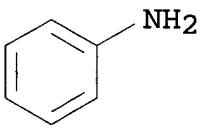
RN 25233-30-1 HCA

CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3

CMF C6 H7 N



CC 72-2 (Electrochemistry)
Section cross-reference(s): 35, 36, 66

IT Permeability and Permeation
(redox of polyaniline in **sulfuric acid** accompanied by potential-dependent permeation of water)

IT Electric **conductors, polymeric**
(transport of **protons** and water through polyaniline)

IT Redox reaction
(electrochem., of polyaniline in **sulfuric acid** accompanied by potential-dependent permeation of water)

IT **1333-74-0P**, Hydrogen, properties
(electrochem. evolution during aniline polymn. on porous platinum studied by cyclic voltammetry and mass spectrometry)

IT **7664-93-9**, **Sulfuric acid**, uses
(redox of polyaniline in **sulfuric acid** accompanied by potential-dependent permeation of water)

IT **25233-30-1P**, Polyaniline
(transport of protons and water through polyaniline membranes studied with online mass spectrometry)

L65 ANSWER 5 OF 6 HCA COPYRIGHT 2006 ACS on STN

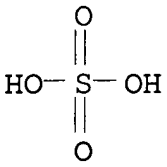
105:7055 Electrically conductive aniline polymers. Tamura, Shohei; Sasaki, Sadamitsu; Sasaki, Takeshi; Abe, Masao; Miyatake, Hiroshi (Nitto Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 61021129 A2 **19860129** Showa, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1984-142845 19840709.

AB An elec. conductive polymer with cond. ≥10°S/cm is prepd. by electrolysis of an aniline soln. contg. **H2SO4** at 1:≥5-30 aniline- **H2SO4** equiv. ratio and a voltage >1 V higher than the std. calomel electrode and 0.01 mA/cm2-1 A/cm2. Thus, the **electrolytic polymn.** was conducted in a 5% aq. aniline soln. contg. **H2SO4** in 1:8 equiv. ratio at +2V (initially) and 5 mA/cm2 for 2 **h** to **form** a **H2SO4**-doped aniline polymer on a Pt electrode maintaining cond. 2.6 S/cm after 4 mo of exposure to air.

IT **7664-93-9P**, properties
(aniline polymers doped with, elec. conductive, oxidative degrdn.-resistant, prepn. of, by **electrolytic polymn.**)

RN 7664-93-9 HCA

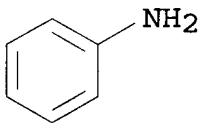
CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



IT **25233-30-1P**
(**sulfuric acid**-doped, elec. conductive, oxidative degrdn.-resistant, prepn. of, by **electrolytic polymn.**)
RN 25233-30-1 HCA
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



IC ICM C08G073-00
CC 35-7 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 76
ST aniline polymer **sulfuric acid** doping; elec conductive aniline polymer; **electrolytic polymn** aniline
IT Electric conductors
(aniline polymers, doped with **sulfuric acid**, oxidative degrdn.-resistant, prepn. of, by **electrolytic polymn.**)
IT Polymerization
(electrochem., of aniline in presence of **sulfuric acid**, in manuf. of elec. conductive polymers with high oxidative degrdn. resistance)
IT **7664-93-9P**, properties
(aniline polymers doped with, elec. conductive, oxidative degrdn.-resistant, prepn. of, by **electrolytic polymn.**)
IT **25233-30-1P**
(**sulfuric acid**-doped, elec. conductive, oxidative degrdn.-resistant, prepn. of, by **electrolytic**

polymn.)

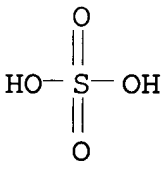
L65 ANSWER 6 OF 6 HCA COPYRIGHT 2006 ACS on STN
103:88374 Electroconductive organic polymers. Tamura, Shohei; Sasaki, Sadamitsu; Abe, Masao; Nakazawa, Hitoshi; Ichinose, Hisashi; Nakamoto, Keiji; Sasaki, Takeshi; Ezoe, Minoru; Sakagawa, Mitsuo; Miyataka, Hiroshi (Nitto Electric Industrial Co., Ltd. , Japan). Ger. Offen. DE 3441011 A1 **19850605**, 69 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1984-3441011 19841109. PRIORITY: JP 1983-212280 19831110; JP 1983-212281 19831110; JP 1984-198873 19840922.

AB Polymers contg. the repeating units -p-C6H3(R)N:C6H3(R):N-p- (R = **H**, alkyl), **prepd.** by oxidative polymn. of aniline derivs., when doped with electron acceptors have elec. cond. ≥10 μS/cm. Thus, adding a soln. of 1.84 g K2Cr2O7 and 4.61 g **H2SO4** in 28.8 g H2O over 30 min to a soln. of 5 g PhNH2 and 4 mL cond. HCl in 45 g H2O stirred in an ice bath and stirring 30 min gave a green polymer **[25233-30-1]** with inherent viscosity (**H2SO4**, 30°) 0.46 and elec. cond. 2.0 S/cm, unchanged on standing 4 mo in air or when measured in vacuo (0.01 torr).

IT **7664-93-9**, uses and miscellaneous
(doping agent, for elec. conductive polyanilines)

RN 7664-93-9 HCA

CN Sulfuric acid (8CI, 9CI) (CA INDEX NAME)



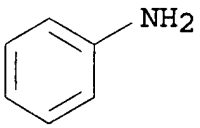
IT **25233-30-1P**
(elec. conductive, proton acid-doped, manuf. of)

RN 25233-30-1 HCA

CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



IC ICM C08G073-02
ICS H01L031-04; H01L029-28; H01B001-12
CC 35-5 (Chemistry of Synthetic High Polymers)
ST elec conductor polyaniline; aniline polymer elec conductor; doping polyaniline conductive; oxidative polymn aniline; chromic acid polymn aniline; **sulfuric acid** polymn aniline
IT Electric **conductors**
(aniline deriv. **polymers**, **proton** acid-doped, manuf. of)
IT 7601-90-3, uses and miscellaneous 7647-01-0, uses and miscellaneous **7664-93-9**, uses and miscellaneous 7697-37-2, uses and miscellaneous 10035-10-6, uses and miscellaneous 16872-11-0 16940-81-1
(doping agent, for elec. conductive polyanilines)
IT **25233-30-1P** 97917-08-3P
(elec. conductive, proton acid-doped, manuf. of)

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